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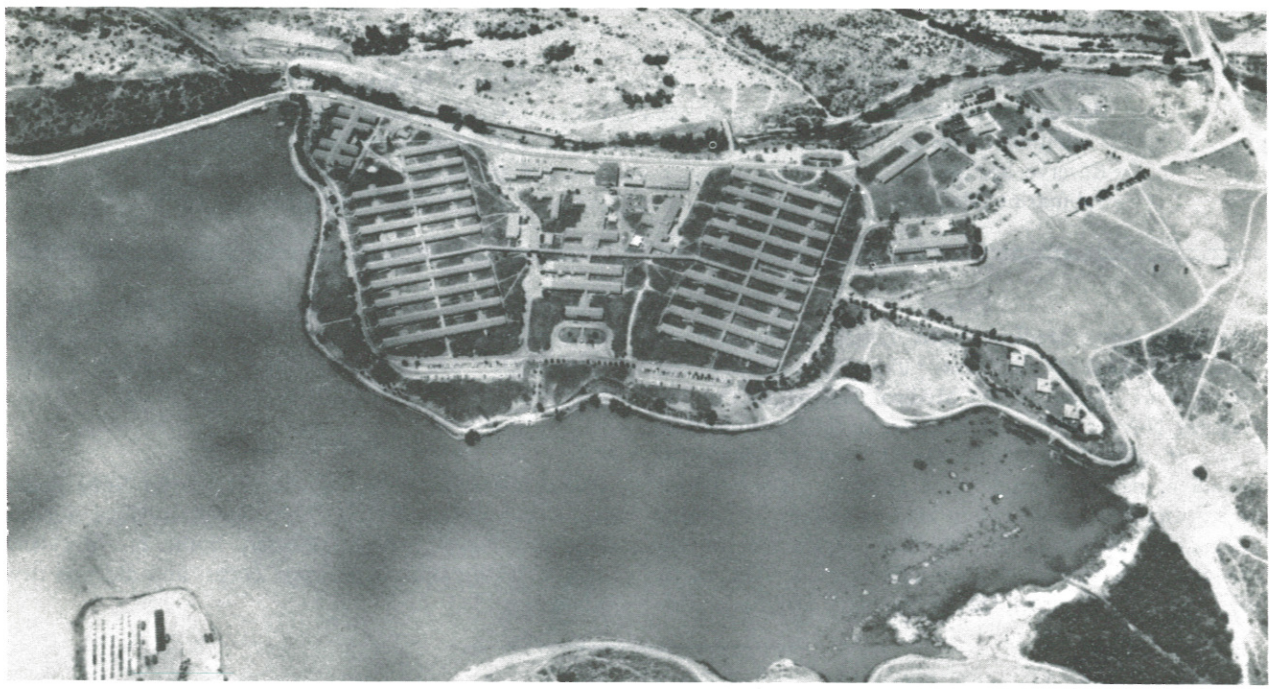

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Policy

The U.S. Navy Medical News Letter is basically an official Medical Department publication inviting the attention of officers of the Medical Department of the Regular Navy and Naval Reserve to timely up-to-date items of official and professional interest relative to medicine, dentistry, and allied sciences. The amount of information used is only that necessary to inform adequately officers of the Medical Department of the existence and source of such information. The items used are neither intended to be, nor are they, susceptible to use by any officer as a substitute for any item or article in its original form. All readers of the News Letter are urged to obtain the original of those items of particular interest to the individual.

Change of Address

Please forward changes of address for the News Letter to: Commanding Officer, U.S. Naval Medical School, National Naval Medical Center, Bethesda, Maryland 20014, giving full name, rank, corps, and old and new addresses.

FRONT COVER: U.S. Naval Hospital, Camp Pendleton, California. On 4 March 1942, the Shore Station Development Board, Navy Department, recommended and on 5 March 1942, the Secretary of the Navy approved purchase of 113,000 acres of the Santa Margarita Ranch, San Diego County, California for a Marine Corps Training Center.

The Bureau of Medicine and Surgery, on 23 July 1942, recommended the construction of a 600-bed hospital of temporary construction and three dispensaries to be located in the headquarters and regimental areas.

The Secretary of the Navy designated this facility the U.S. Naval Hospital, Santa Margarita, California, on 25 September 1942. Since this name resulted in confusion of routing the mail because of the existence of a town elsewhere in the state by that name, the hospital on 18 November 1942 was re-designated the U.S. Naval Hospital, Santa Margarita Ranch, Oceanside, California. On 26 May 1952 another re-designation was made and the activity is currently the U.S. Naval Hospital, Camp Pendleton, California.

By the winter of 1942 the number of Marines undergoing training at Camp Pendleton had increased so much that it was obvious that the 600-bed hospital would be too small, and on 25 February 1943 the Bureau of Medicine and Surgery recommended that the size of the hospital be doubled. The construction of the hospital took about one year, the facility being placed in commission on 3 September 1943.

During 1955, the laboratory became one of the first in the Los Angeles-San Diego area to extensively use the micro-hematocrit in routine laboratory work. The clinical chemistry department is also being converted to micro-methods. This activity has been designated as a study group by the California Cancer Commission and as such receive their monthly seminar slides, in addition to the privilege of being able to submit materials for consultation.

The issuance of this publication approved by the Secretary of the Navy on 4 May 1964.

SPECIAL ARTICLE

PROBLEMS WHICH THE MEDICAL OFFICER IN VIET NAM MAY ENCOUNTER

CAPT R. H. Brown MC USN.*

This is the first in a series of three medical articles being presented for publication in the U.S. Navy Medical News Letter by CAPT R. H. Brown MC USN, LCDR J. S. Cox MC USN, and LCDR S. D. Harman MC USN—on the subject of wounds and injuries. It is hoped that other medical articles may be received from other Navy Medical Department officers in the various specialties on subjects of timely interest.

Today our effort is not to contemplate the forces of diplomacy, politics, strategy, or statecraft which have raised a serious threat of intensification of our military commitment in Viet Nam. The fact, however, is that we are becoming militarily involved there so that some of us who are sitting comfortably here may expect to be called upon to be associated with the troops. This is our raison d'etre, and the doctor's draft, the Berry Plan, the Reserve Programs, and the Regular Medical Corps together have assured our fighting forces adequate medical support through the cold war years. To continue to do so in the light of military escalation is our basic mission.

We wish to present some aspects of the problems of war wounds and although there is an emphasis on extremity wounds, no one specialty is exempt from responsibility for medical care of the troops. Specialty lines may be crossed over under some circumstances, so that it behooves each of you to reassess your knowledge, understanding that your basic status is that of "Doctor of Medicine," an all-inclusive term.

Just over a century ago the Civil War started. At the outset, chaos in terms of specific medical treatment of the sick and injured became obvious. Contract surgeons would work in the field a few weeks, and then return to private practice. The few career military medical officers who existed were diluted when those with southern leanings went over to the Confederacy. No cadre of trained medical assistants such as our Hospital Corps existed. The Nurse Corps was hardly recognizable as such. Medical supply was haphazard. Transportation of the wounded was rough and erratic, and whoever was available was pressed into action as litter bearers. Out of this confusion came order. The vision of men such as Surgeon-General Hammond brought about many organizational changes leading to a better medical output. The Army Medical Museum is such an example, and even to this day many visit it at its present location at Seventh and Independence here in Washington, to see the marvelous collection of Civil War specimens, as well as specimens from subsequent wars.

The toll of the Civil War was surpassed only by that of World War II in terms of the United States. Table I shows the statistics:

Table I

Battle Deaths in U.S. Wars

American Revolution	4,435
Civil War—Union	112,246
Confederacy	74,524
World War I	52,429
World War II (excludes missing)	256,330
Korean Conflict	38,000

We tend to pay little attention to the accidental deaths which occur in peacetime in the United States. In 1964 there were 106,000 accidental deaths, of which 47,000 occurred on our highways. The tragedy of battle deaths, however, lies in the fact that our healthy youth are the major victims.

World War I, although involving the Navy Medical Department to a lesser degree as far as battle wounds, was fought chiefly on European soil which had been heavily contaminated by fertilization for centuries. Tetanus was a far greater problem for the medical officer than in the Civil War which was fought on a much cleaner soil, bacteriologically. The psysiological mechanisms of shock were studied

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in World War I, but the techniques of blood preservation did not permit the use of whole blood nor plasma to manage acute shock until the outset of World War II. The impetus of war gave us increased output of penicillin, and penicillin, plus its sulfonamide predecessors, made a more predictable management of medical infections as well as infected war wounds. The Thomas splint, developed prior to World War I, continued to be useful in transporting the patient with a fractured femur. However, the airplane made it not only possible to rapidly deliver blood, but also to transport the wounded back to a center where more effective treatment was available.

In World War II the Marine Corps had .widespread commitments, in contrast to their limited participation in France in World War I. The knowledge of tropical, as well as arctic, medicine was needed, and the Navy medical officers were furnished such appropriate knowledge. Transports which off-loaded invading Marines stood off shore to receive invasion casualties, and the use of landing craft expedited this transfer of patients. Tetanus toxoid made clinical cases of tetanus virtually nonexistent.

A glance at Table II will emphasize that the United States was not alone in a high toll of battle casualties:

Table II

Military Battle Casualties

World War II (Includes Missing)

Allies: 10,648,474	
United States	295,904
British Commonwealth	452,570
U.S.S.R.	7,400,000
China (Since 1937)	2,200,000
France	200,000
Axis: 4,646,000	
Germany	2,850,000
Italy	300,000
Japan	1,506,000

We tend to forget some of the lessons we learn after each war, but are quicker to correct our errors. It took a severe winter in Korea to reinstill us with the stringent necessities of adequate prophylactic foot care for the number of troops, Marine Corps and Army, suffering from frostbite in the tragic retreat from North Korea was alarming. After this first winter, frostbite was a minor occurrence. For several reasons, including the helicopter as well as the nearly absent enemy air strikes, we lessened the interval between the time of injury and the time that definitive surgical treatment was given. In World War II it took an average of 8.9 hours, and in the Korean War 6.3 hours. Body armor was improved and used somewhat more extensively in the Korean War. The result was a relatively larger number of extremity wounds and a smaller number of thoracic and abdominal wounds from missiles.

In conclusion, I would like to emphasize that the opportunity to learn and to adapt to change is in no way diminished during war. Each of you recent medical school graduates have had a sophisticated scientific background from which to start and to grow. Keep your eyes open not alone for your own personal survival, but for the chance to learn so that you may improve patient care. Whatever your fate, I would like to point out that the overwhelming majority of medical officers have a tradition of having acquitted themselves well.

MEDICAL ARTICLES

DISTURBANCES DUE TO COLD

Method of E. E. Hedblom, Captain, MC, U.S. Navy, U.S. Naval Air Station, Oak Harbor, Washington.

In all cold weather injuries there are four physical variables. *Temperature* and *moisture* govern the type of lesion developed. *Wind* and *length* of exposure govern only the speed of development and severity. In discussing treatment, preventive measures not always obvious to the uninitiated are included, for as Dr. William Mills of Anchorage, Alaska, has said, "The best treatment of a frozen foot is its prevention."

Chilblains

This mildest of dry cold weather injury occurs with repeated prolonged exposure of bare skin at temperatures from the low 60's F. down to freezing. It is common in the fashionably bare knees of British school boys. Acutely, it is red, swollen, hot, more or less tender and usually itches. Between periods of reactivation the skin is red and rough. There is no loss of tissue in untreated cases.

Treatment: (1) Dress adequately to prevent continued exposure; (2) Any bland soothing ointment for discomfort.

Frostbite (Superficial Frostbite)

In an attempt to clarify confusion in the literature regarding degrees of frostbite or freezing, and to delineate what should and what should not be thawed in the field, frostbite may be defined as a skin condition similar to sunburn, little deeper, in two degrees of severity: 1st degree—redness, followed by branny desquamation; and 2nd degree—blister formation in 24 to 36 hours followed by sheet desquamation. It is most common following brief exposures to extreme cold. Below 20° F., the speed of contraction depends on temperature, duration of exposure and adequacy of protection. Accompanying this condition *per se,* there is rarely a remarkable lowering of general body temperature.

It is dangerous on the feet, annoying about the face and hands. Its onset is signaled by a sudden blanching of the skin or nose, ear or cheek which may be subjectively noted as a momentary tingling or "ping." Face muscles won't work. The "buddy system" of men watching each other's faces for the telltale yellow-white spots minimizes tissue damage by early detection. The skin is anesthetic. In severe cold if face, hands or feet STOP hurting, *investigate* —you probably have frostbite. When palpated, unthawed frostbitten skin may be cold and frosty, crisp or resilient. It may move freely over joints, knuckles or facial bones; however, thawed superficial frostbite may be indistinguishable from deeper freezing injury.

Prevention of Frostbite

1. Face

a. A moderately stiff 4 to 5 inch deep tunnel extending in front of the facial aperture of parkas protects the face from wind at all but about 90 degrees dead ahead. This should contain a malleable wire at the outer aperture so that the opening may be shaped.

b. Face Mask. These are particularly needed by air crews who must work in aircraft propeller blast. A windproof pile-lined band, which will cover cheeks and tip of the nose only, is satisfactory under many conditions.

2. Hands. Windproof leather gloves or mittens are most satisfactory. Particular care should be taken not to let the hands get wet with kerosene, gasoline, alcohol or other fluids which freeze below 32° F., for these cause quick frostbite and freezing. Touching of very cold bare metal with warm, moist bare hands results in the skin sticking to the metal, causing mechanical loss of tissue or quick frostbite.

3. Feet. Foot gear MUST be roomy enough to permit easy movement of the toes, for flexion and ex-

tension of the toes increase circulation and delay frostbite, particularly in cases of immobility or concomitant injury suffered in trail or plane operations.

To be particularly avoided are flying boots or galoshes worn over ordinary shoes. Frozen feet result because inner laced shoes do not permit swelling concomitant with frostbite or shock.

Treatment of Superficial Frostbite

Clinically it has been proved that the quick thaw of freezing injuries in a water bath of 40 to 43° C. (104 to 109° F.) has a specific benefit on ultimate tissue recovery. Superficial frostbite is rarely seen where such treatment is available; however, it should be treated immediately whenever encountered, lest it progress to a freezing injury.

In the field, frostbite of the face is thawed by placing a warm hand over the spot until it hurts again. Petrol pocket warmers inside survival mittens or parka pockets assure warm hands with which to thaw out face spots. Frostbite of the fingers is best treated by wearing a parka with sufficiently large armholes that the arm may be drawn inside the sleeve and the hand warmed under the opposing armpit. (Thawing by opening front-opening coats allows loss of vital body core temperature from the exposed thorax and threatens survival.) Frostbite of the feet is best thawed on the warm belly under the parka of a trail mate. (This is the height of brotherly love and the hallmark of a true trail mate.) Warm the heels and the toes will rewarm more quickly.

Chemical heating pads are not always available and are never hot when needed. Placed on bare skin without blanket or towel insulation, they may cause burns, particularly in the unconscious or those with cold-anesthesized extremities. Under NO conditions should frostbite be treated by rubbing, with or without snow or slush. When it begins to peel, as does sunburn, any bland lanoline base ointment will allay discomfort.

Freezing (Deep Frostbite)

When ice crystals form in tissues deep to the skin and its immediate subcutaneous tissues, an extremity is frozen. This is the third and fourth degree "frostbite" of literature. As "degrees" cannot be clinically distinguished before or during treatment, and as treatment is the same for all deep frostbite, regardless of degree or duration, why quibble about degree? Freezing is always preceded by frostbite. It occurs most critically in the feet, occasionally in the hands and ears.

Unthawed, it is painless. Tissues have a pallid yellowish color and appear somewhat translucent or waxy. Skin will not roll over bony prominences. Members may become quite solid or "wooden" to palpation, but never brittle. When brought indoors, the skin will collect droplets of moisture from the atmosphere just as a cocktail glass "sweats." Without rapid rewarming, blisters appear in 12 to 36 hours. Red-violet discoloration appears spontaneously on the first to fifth day. (This is not the slate gray discoloration observed distal to arterial occlusion.) Termination without proper treatment is usually dry gangrene. Residual hypesthesias, paresthesias and sensitivity to cold in recovered extremities are probably due to anoxic injury to the nerves from long wet cold exposure (trench foot) suffered prior to actual freezing. These seem to be more severe in frozen extremities which have not been rapidly rewarmed.

Prevention of Freezing

1. Prevent Frostbite.

2. Maintain "core" or general body temperature with adequate nutrition, hot meals and hot fluids.

3. Avoid excesses of alcohol in potentially freezing situations. It promotes excessive cooling from peripheral vasodilation (the subjective "warm feeling"), but more important its narcotic sleepiness and euphoria, causing loss of judgment, perception and ambition necessary to fight cold, contribute to freezing injuries and death from general hypothermia.

4. Avoid excessive fatigue, mental or physical, for like alcohol, fatigue causes neglect as well as lack of strength for preventive measures.

Treatment of Freezing Injuries

Field First Aid

1. Raise patient's core temperature (see Hypothermia, below).

2. There must be NO constrictions to circulation from boots or crampons above or over the frozen area. Immobilize concomitant fractures loosely without traction, for the snug bandages necessary for traction will further jeopardize circulation and increase freezing damage. For the same reason, avoid pneumatic splints.

3. NEVER thaw or rewarm a FROZEN extremity until arrival at a medical facility with water, heat, power and equipment for sterile bed care

where extremities can be RAPIDLY rewarmed, for the following reasons:

a. Medical

(1) If thawed and REFROZEN, loss of digits and perhaps a hand or foot is the invariable outcome from gangrene which occurs in four to seven days.

(2) Rapid rewarming is a specific therapy which minimizes ultimate tissue loss and sequelae. Rather than thaw in the field, it is preferable to keep an extremity frozen for four to eight more hours to enable rapid rewarming and immediate hospital care.

(3) The swollen, edematous, painful, thawed extremity is more subject to infection during transportation than is the frozen extremity, and infection is the chief reason for loss of tissue.

b. Logistic

(1) A man with a frozen extremity is not a stretcher case unless he suffers concomitant fracture or other serious injury. Under survival conditions, keeping his leg frozen, Freuchen walked miles and days for help, knowing that should it thaw he would be helpless.

(2) A stretcher case requires at least two men to carry him or pull him on an Akja or toboggan.

(3) An ambulance, truck or helicopter will haul only four to six stretcher cases, but they will haul 6 to 24 men with one or more frozen extremities each.

4. If the frozen member has thawed spontaneously, or has been thawed by a well intentioned native or trail mate, bandage the injured member loosely but securely in a voluminous cotton wool bandage to prevent further physical trauma during transportation.

5. No alcohol, vasodilating drugs, anticoagulants or friction.

Hospital Treatment

1. Raise patient's core temperature (see Hypothermia, below).

2. Routinely and vigorously treat shock with elevation of feet, warmth, oxygen, and intravenous blood plasma or fluid should they be necessary. These patients, particularly those with concomitant injuries, often go into *profound shock* on admission to a hospital facility where it is warm.

3. If still frozen, rapidly rewarm in tub or water bath with pump or paddle, open top washing machine, or whirlpool bath above body temperature but not "hot" to normal hand. Water at 102° F. is "warm" to a normal hand, 116° F. is as hot as the average person can stand continuously. A safe temperature seems to be midway between the two. Dr. Rudolph Campbell of Switzerland, Chairman, International Commission of Alpine Rescue, prefers increasing temperature from 50° F. over 30 minutes to a final 102° to 106° F. Mills and his associates in Alaska have successfully used 105° to 112° F. NEVER go over 115° F. or use dry heat, for this will superimpose a burn on the already insulted tissues. Thawing may take from 20 minutes to an hour, but it should be continued until all blueness or paleness of the digital tips has turned pink to burgundy red, and NO LONGER.

A large proportion of these cases have alcoholism as a predisposing or concomitant complication. Also, man, suddenly thrust into an extremely cold environment under survival conditions, through fear (often stark terror) becomes psychotic. When he observes his pale, painless, frozen extremity turn burgundy color with more or less painful rapid rewarming, more fear is generated. These patients may require protective measures, tranquilizers or morphine for immediate thawing pain, and sometimes force to bring the first thawing to the proper end.

4. If already thawed, DON'T rewarm.

5. Tetanus booster on admission.

6. Physiotherapy (Most important)

a. Twice daily half hour whirlpool water bath (90 to 98° F.), containing a mild detergent or soap, until healing or spontaneous amputation takes place.

b. Immediate active joint motion particularly during hydrotherapy. This usually requires supervision and encouragement to overcome patients' pain, laziness and/or apathy.

c. Buerger's exercises 20 to 30 minutes every four hours during day.

7. Surgical Care.

a. For the first two to three weeks until the skin is dry and without blebs or lymph drainage, ALL attendants MUST use sterile isolation technique with masks, gowns, gloves, bedsheets, etc. to minimize infection. Treatment of elevated member under a cradle is open without dressings, bandage or ointment. Sterile cotton between toes minimizes maceration.

b. Blisters invariably complicate freezing injuries. Early and clear blisters, particularly down to the tips of digits, are a good sign. Higher blisters, and particularly blood-filled blisters, are an

ominous sign that perhaps a digit will be lost. *Leave all unbroken blebs alone.* For the first two to three weeks, debridement is limited strictly to trimming gross skin flaps loosened by the daily hydrotherapy. When the wound is dry and uninfected, constricting digital eschars interferring with joint flexion may be silt laterally or dorsally. *Trust the whirlpool* to atraumatically and aseptically clean up local infection and to debride blisters and eschars.

c. NO AMPUTATION FOR AT LEAST THREE MONTHS or until after autogenous (spontaneous) amputation, unless there is overwhelming infection or concurrent injury which requires it! This will minimize tissue loss and ultimately reduce hospital time by giving healthier tissue for such repairs or skin grafts as may be necessary. Color of skin or amount of skin loss below the line of demarcation is NOT indicative of the end result. Skin can always be replaced; a prematurely amputated digit, hand, foot or leg CANNOT!!

d. Split thickness or pedicle skin grafts when denuded granulating areas are ready.

e. *Sympathectomy.* Recovered dry frozen members are usually relatively painless, though they often have intrinsic muscle and fat pad atrophy. After six months, if disabling concurrent wet cold sequelae are improved by sympathetic block, sympathectomy should be performed.

8. Broad-spectrum antibiotics are administered only with evidence of deep infection or cellulitis.

9. Psychiatric Measures. Opiates should be avoided after initial thawing because these patients are subject to addiction. During the first three months, pleasant environment, frequent visits, encouragement and occupational therapy are mandatory. Depressed patients often talk surgeons into amputation because of depression over a black foot or finger. Tranquilizers, alcohol, barbiturates and/or dextroamphetamine may be indicated during this period. (The physician often needs this therapy himself during this period, for his urge to do something surgical makes him the patient's and his own worst enemy.)

10. Give the following: ascorbic acid 50 mg every four hours; Hesperidine (or Rutin) 50 mg every four hours; nicotinic acid 50 mg every four hours; vitamin E (alpha-tocopherol) 30 mg daily; vitamin A 25,000 to 50,000 units daily.

11. High caloric, high protein diet.

12. The most promising new therapy for freezing injuries is intravenous administration within an hour after admission of 1.5 grams per kilogram body weight of 10% low molecular weight (41,000) dextran in normal saline, repeated twice daily for the first five days. This must be given very slowly to prevent overloading the heart. It is reported that in northern Sweden LMWD is routine for the first eight days.

13. Smoking is discouraged.

14. NO anticoagulants, NO vasodilating drugs, NO high intensity sound therapy.

Immersion Foot (Trench Foot or Bomb Shelter Foot)

This results from wet cooling for hours or days of an extremity or portion thereof at temperatures above freezing. Dependency and/or immobility of the extremity aggravates and predisposes. Sailors in sea water or soldiers with wet feet in trench or foxhole may have the same condition. Nerve, muscle and blood vessel injury due to cooling is the common feature. General body chilling and venous stasis are certainly etiologic factors.

On first examination in the stage of ischemia the foot is cold, swollen, waxy, and mottled with cyanotic, burgundy to blue splotches. It is resilient to palpation in contradistinction to the frozen foot. Anesthetic skin and loss of deep proprioception make walking difficult.

The first stage is followed by the hyperemic phase which lasts days to weeks. The feet are red, swollen and hot; blisters often form. "Recovered" immersion feet often have edema, deep pain, superficial burning, cold sensitivity and hyperhydrosis. The best treated cases often result in gangrene. Disability may last for months or years.

Treatment differs from the treatment for frostbite in the following particulars:

1. No rapid rewarm.

2. Hydrotherapy is used only for blebs, ulcers or infection.

3. Drugs for relief of pain are more often necessary, but should be used minimally and discontinued as soon as possible.

4. Vasodilation and circulation should be assisted within hours by:

a. Sympathectomy.

b. Heparinization, maintained until feet have "normal" vascular response and are relatively painless.

c. Regular administration of alcohol. (One ounce hard liquor every hour may help circulation. This therapy has also been known to cure this socially popular habit!)

5. Massive vitamin B complex therapy is certainly indicated.

In a military environment such as Korea where winter daytime temperatures were in the 40's F. and nights were below freezing, or in uniform subfreezing temperatures where men wear watertight, thermal boots and their feet are continually bathed in their own perspiration, injuries are usually mixtures of both wet and dry cold. If it is suspected that an immersion foot may have also been frozen once, therapy directed toward the immersion foot regimen will probably produce the best end results.

General Hypothermia (Chronic, Dry Cold)

As an internal combustion engine, man burns fuel in the muscles to produce work and heat, but a core temperature of at least 95° F. is necessary to maintain the process. Diminished oxygen, food, faulty circulation, poor condition, narcosis and/or fatigue diminish the fire.

At environmental temperatures less than 68 to 70° F., man's survival depends upon insulation (body fat, clothing), ratio of body surface to volume, the body fire (basic metabolism rate) and the will to survive. Below 95° F., hypothermia produces diminishing BMR heart rate, blood pressure and uncontrollable shivering. Hallucinations, apathy and narcosis occur at 86 to 80° F., death from ventricular fibrillation or cardiac arrest at 80 to 75° F.

Freezing to death in dry cold is a very pleasant way to go. Those who have come close describe the symptoms as extreme fatigue (only the fatigued sleep through the violent shivering), weak muscles, joint stiffness, and ultimately a feeling of warmth, comfort and an overpowering sleepiness. Unconsciousness and death follow painlessly.

Treatment is that of Immersion Hypothermia (see below).

Immersion Hypothermia (Acute, Wet Cold)

Sea water freezes at 28 to 29° F. It may be assumed that most polar water with ice nearby is this cold. Man submerged in this water, depending on amounts and type of clothing worn, has his breath knocked out. There is initial shivering and then the body goes into a position of spastic fetal flexion with hands and knees under the chin, and voluntary control of the muscles is lost. (The ungloved hand is useless in one to five minutes.)

In water the body core temperature falls very rapidly. On first submersion there is reflex contraction of the arterioles to save temperature. This gives a fleeting increase in blood pressure and heart rate. Consciousness lasts five to seven minutes, death occurs in 10 to 20 minutes.

Cold shock causes strychnine-like electroencephalographic patterns and therefore probably should not be treated with stimulants. Exposure of the back of the head and neck was found to cause cerebral hemorrhage and death at Dachau, so this part of the anatomy should be particularly protected. Loss of breathing and necessity for artificial respiration is due to spasticity of the muscles of respiration.

In a few instances men have saved themselves by violent exertion as soon as they hit the water, were able to swim some distance and pull themselves out on the ice or up a ladder. More have died or would have without help because of muscle spasm.

In water at 41° F. for 12 minutes it has been found that moderate work doubled the rate at which rectal temperature fell, because of increased blood circulation. Working as hard as possible only slightly decreased the rate of temperature loss at this temperature. If in a marine disaster at temperatures not causing the above acute reaction, exert yourself as little as possible—you'll live longer. In water at 59° F., clothing reduces loss of temperature by three-fourths. The obese have been found to be better insulated from loss of temperature (and slower to rewarm), responding in direct proportion to the thickness of their subcutaneous fat.

With a large number of cases, as in shipwreck, treat those not breathing (but alive) and the unconscious first. Pouring water at 105 to 114° F. over those waiting for treatment will increase the number of survivors, for after removal from the water (without treatment) a paradoxical "after drop" in core temperature lasting 20 or more minutes and amounting to 7° F. will kill many.

Treatment

1. Unconscious, Not Breathing.

a. Artificial respiration, with oxygen if available, keeping patient as warm as possible with hot water bottles, warm wet packs, etc.

b. If the patient is in ventricular fibrillation (and still alive), electrically defibrillate or give procainamide (Pronestyl), said to be more effective in this acidotic condition than is quinidine. Fibrillation may continue for 1½ to 2 hours after body temperature has returned to normal.

c. In general (chronic) hypothermia, dehydration is often acute and intravenous glucose and/or

dextran is indicated to expand blood volume and support metabolism.

2. Unconscious, Breathing

a. Place in a tub or shower with water 105 to 112° F. and keep there until rectal temperature is above 95° F. or the patient has stopped shivering.

b. Put in a warm sleeping bag with heating pads, hot rocks, etc.

3. Conscious

a. Put in a tub or shower with water at 105 to 112° F. and leave there until subject stops shivering.

b. When rectal temperature is above 95° F., 2 ounces of brandy or whiskey in a hot drink promotes quicker warming and a sense of well being.

"Frostbite" of Lungs

During hyperventilation following strenuous exercise at temperatures below −25° F., particularly at high altitudes, man coughs up blood from the tracheobronchial tree. This is not a "frostbite" since there is no freezing of tissue. Marked respiratory mucosal hyperemia (as in flash burn) causes this expectoration of frank blood. Concurrently or as an aftermath, an asthmatic type of breathing may occur for periods of hours to a day or two, depending on the severity of exposure, the altitude and the individual.

This condition can be prevented to some extent on trail by slowing down and by utilization of parka hoods, face masks, folded mufflers, etc., which enhance some rebreathing of warmed humidified expired air. There is no immunity for the condition.

Treatment is symptomatic: Humidify quarters to 30 percent, bed rest, steam inhalations, oxygen as needed if available, and forbearance from smoking until the breathing difficulty, hemoptysis and cough subside.

NEPHROPATHY OF DIABETES WITH EMPHASIS ON PAPILLARY NECROSIS

Benedict R. Harrow MD, University of Miami School of Medicine, Coral Gables, Florida.* *Postgraduate Medicine 37(5): A-63-A-69, May 1965.*

An important common denominator of diabetic nephropathy has been a superimposed pyelonephritis. Although the infection is often a secondary phenomenon, the resultant increase in kidney damage hastens uremia and death. The basic nephropathies leading to pyelonephritis are diabetic glomerulosclerosis, arterial and arteriolar sclerosis, and renal papillary necrosis (RPN). Of course, acute recurrent and chronic types of pyelonephritis also occur frequently as a primary process.

Pyelonephritis

There is general agreement that pyelonephritis is far more prevalent in diabetics than in the remaining population. However, diagnostic criteria for pyelonephritis vary considerably, as Kimmelstiel et al.[1] so aptly emphasized. Because of lack of standardization of the criteria, the percentage of renal infection varies greatly from report to report even in the general population. As of this writing there has been no statistical proof for the more frequent occurrence of renal infection in diabetics, and in several series no increase in the incidence of bacteriuria has been shown.[2, 3] Nevertheless, my impression, like that of others, has been that renal infection is much more common, more prolonged and more difficult to treat in diabetics than in other patients. In my private practice, gas-forming infection of the kidneys and ureters has been encountered mainly in diabetics, again demonstrating the severity of the infection.[4] Cystitis emphysematosa has also been spontaneously encountered mainly in diabetic patients. Appropriate antimicrobial therapy has been effective in controlling and eliminating the infection except in renal emphysema where surgery is required. Atonia of the bladder from impairment of sensory nerve roots is a factor in some instances of urinary tract infection.

Vascular Disease

Azotemia is a primary or an important contributory factor in a large percentage of deaths from diabetes. However, the increased incidence of vascular disease of the heart, brain and the extremities accounts for more deaths than disease of the kidneys. The more common retinopathy, always present if

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nephropathy exists, does not threaten life itself. The over-all 10 percent death rate from uremia increases to about 25 percent in long-standing cases of juvenile diabetes. In fact, at the Joslin Clinic, Boston, more than half the deaths among patients in whom diabetes developed before age 20 and in whom the disease had been present for 10 to 30 years were due to renal vascular disease.[5] The nodular form of glomerular disease, first described by Kimmelstiel and Wilson[6] in 1936, occurs almost exclusively in diabetes, but the diffuse glomerulosclerosis is responsible for most of the damage leading to uremia. Arterial sclerosis and arteriolar sclerosis are increased in diabetes and contribute to renal failure. Superimposed pyelonephritis causes further damage to many of these kidneys.

Treatment consists of antimicrobial agents for the infection and the usual methods employed for any chronic renal failure. Control of infection and precise control of the diabetes will prolong lives considerably, although even with the best of diabetic treatment a slow progression of renal disease is inevitable.

Renal Papillary Necrosis

In the past, RPN has been found relatively infrequently and has accounted for less than 2 percent of deaths due to diabetes. Moreover, the disease was considered acute, fulminating and almost always fatal. Yet, in private practice I have found an incidence of papillary necrosis of 18 percent in 50 cases of long-standing diabetes, that is, diabetes present for more than eight years. The higher incidence has been ascertained from detailed x-ray studies during excretory urography using double, triple and even quadruple doses of contrast agent and severe abdominal pressure[7] or, when they are indicated, retrograde studies.

The diagnostic criteria have been set forth in detail in other papers.[8, 9] The essential point has been that the medullary form of papillary necrosis has been overlooked and usually diagnosed as chronic pyelonephritis. Even the pathologist has missed these smaller cavities on gross specimens.

The medullary form of RPN consists of small or medium-sized cavities in the papilla with no destruction of the fornices of the calyces. This type is the easiest to identify in an early stage. The papillary form of RPN involves the whole surface of the calyceal epithelium together with the fornices. It differs from the medullary form only in extent and may involve the entire pyramid or just the whole papilla. At an early stage it consists of semilunar streaks or ring shadows where contrast agent surrounds the necrotic portion of the pyramid. If the necrotic papilla or pyramid sequesters and remains in place or is trapped in the renal pelvis, calcium salts accumulate on the surface and form stones with non-opaque centers.

The color plate is a cut section of a normal left kidney showing a light brown papilla projecting into the center of the white calyces. Cavities confined to the inside of the papilla represent the medullary RPN seen on x-rays. The darker brown, striated pyramids, supplied from the cortex by vasa recta blood vessels, may partially or completely slough out in papillary RPN. Of course, on pyelograms only the white pelvis and calyces can be identified unless pyramidal cavities form and join the calyces. The pointed tips of the calyces, representing the fornices seen on a side view, are destroyed in papillary RPN.

The use of double, triple and even quadruple doses of intravenous contrast agent, together with compression, allows confident diagnosis of early forms of RPN. A block of balsa wood is applied to the lower abdomen for five minutes with a standard compression band which is tightened every 15 to 30 seconds. Partial blockage of the ureters results, with excellent filling of intrarenal structures that mimics that on retrograde pyelograms. By such studies RPN is readily differentiated from neoplasms, calyceal diverticula, pyelorenal backflow, renal dysplasia, sponge kidneys and ectasia of the papillary ducts. Serial studies may be necessary to rule out blood clots or true stones. Renal tuberculosis can be diagnosed by the irregularity of the cavities, strictures of the ureters and infundibula of the calyces, and urine cultures positive for tubercle bacilli. In late stages RPN may mimic chronic pyelonephritis on x-ray and can be distinguished only if serial urograms have been performed or if necrotic pyramids have been recovered by straining the urine or through the cystoscope.

The basic process of RPN is blockage of the vasa recta leading to an ischemic necrosis. I feel that pyelonephritis is not the cause but rather a secondary process that involves devitalized tissue. Experimentally, ligation of renal veins, ligation of ureters with concomitant intravenous injection of bacteria or toxin, fat-free diets, and certain drugs have produced RPN. Clinically, obstruction of the ureters was first described as the cause of the papillary necrosis, but in actuality this has rarely, if ever, caused the lesion. In many cases no cause has been found, but a significant number of patients have

ingested tremendous quantities of phenacetin-containing compounds. Most evidence points to the phenacetin itself as the agent responsible for the renal damage. In addition, Sloane, Liebman and I[10] were the first to describe the medullary form of RPN in sickle cell trait.

Diabetes mellitus itself is probably the most common cause for RPN, and neither phenacetin abuse nor sickle cell trait was a factor in any of our diabetic patients. In most of the cases of RPN from diabetes, the medullary necrosis and even the papillary form of necrosis progressed slightly or not at all. Only one of nine patients died from the papillary necrosis; the others remained well despite the subacute RPN. However, renal function gradually decreased because of the associated vascular changes.

From a practical standpoint, the main treatment is for the infections that often superimpose on the necrosis. Appropriate antibiotic therapy controls the acute phases. The gratifying aspect has been control of chronic infection by using sulfonamides and nitrofurantoin (FURADANTIN®) in low dosages over a period of many months or years.)

The other practical aspect has been control of infections by removing obstructions of the ureter or renal pelvis caused by sloughed papillae or stones which have formed on necrotic fragments. Usually the necrotic tissue shrinks or fragments and passes spontaneously. In a few instances it has been necessary to remove such fragments cystoscopically with stone baskets or bypass the obstruction using ureteral catheters until further shriveling has allowed the fragment to pass or be extracted. Conceivably, ureterotomy might be necessary in a rare case, as yet unencountered. On the other hand, open operation has been required in two cases of stones formed on necrotic papillae.

Conclusions

The use of double or larger doses of contrast agent for excretory urography and severe abdominal compression has shown that early forms of RPN are common, 18 percent in long-standing diabetes.

Diabetic nephropathy from glomerulosclerosis, arterial and arteriolar sclerosis, and papillary necrosis occurs and progresses despite present-day methods of diabetic control. Still, every effort for close regulation should be maintained, since renal deterioration may be delayed. All three forms of nephropathy favor a superimposed pyelonephritis. Useful lives can be prolonged by controlling the secondary renal infection. Simple office measures using midstream specimens and two glass tests in men have been adequate in treating infection. Moreover, expensive colony counts do not have to be used excessively, since a one minute methylene blue stain of the sediment gives an excellent indication as to whether an actual infection is being controlled.

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PHYSICAL EXAMINATIONS

CURRENT PROBLEMS IN ENLISTED SUBMARINE PHYSICAL EXAMINATIONS

*By LCDR J. C. Rivera MC USN**

This report reflects the nature and scope of a continuing problem which the medical examining facility in the New London area has faced for many years. Briefly stated, the problem is that inadequate submarine physical screening examinations lead to wasted man days and money. While planning a

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study of the current attrition for all reasons in the Basic Enlisted Submarine course, it was found that there is an urgent need to alert all medical officers and examining ships and stations, via the proper channels, to the present situation.

Article 15–29, Manual of the Medical Department, requires that all candidates for Submarine School be examined prior to reporting to the Submarine Base. It also requires that all personnel reporting to the Submarine School shall again be given a complete submarine physical examination on arrival. The Enlisted Transfer Manual, Article 10. 12e, requires that an applicant for initial submarine training must be qualified for submarine duty in accordance with Article 15-29, Manual of the Medical Department, at the time he forwards his request to the Bureau of Naval Personnel. In spite of all the above requirements, there has been an increase in the number of personnel reporting to the Basic Enlisted Submarine course who are not physically qualified in accordance with the current submarine physical standards.

Background

In 1960, Ninow and Collins[1] reported that the number of rejections at the Submarine School for physical reasons was on the increase among candidates for the Basic Enlisted Submarine course. They analyzed the attrition rates for 31 classes of enlisted men (Classes 175-206, including 6095 men, March 1959-August 1960).

It was shown that 983 men (about 16%) were dropped from these classes for four reasons: (a) physical; (b) academic; (c) non-volunteer, and (d) others. The attrition data for all drops (16%) were further analyzed in order to focus upon those men disqualified for physical reasons only. The average attrition rate, of all drops, for physical reasons in the first 15 classes was 5% and in the next 16 classes it was 7%, a rise of 2%. Table 1 lists the physical reasons for drops in Classes 191-206 (3715 men).

Another report[2] in 1961 analyzed the total number of submarine physical examinations conducted by the U.S. Naval Medical Research Laboratory during the calendar year 1960. Of 5998 examinations, 412 (about 7%) were found not to meet the current physical standards for submarine duty. The principal causes for rejection of candidates upon their arrival at the Submarine Base were: (a) defective visual acuity; (b) defective color vision; (c) psychologic unadaptability, and (d) pulmonary disease or disability. The following interesting facts were observed:

1. The 412 vacancies in the school quota were not filled. The attrition rate, for reasons other than physical, at the Submarine School at that time was about 9%. In substance, then, quota vacancies of 412 resulted in 375 fewer graduates. Four conventional submarines can be manned with this number.

2. In 75% of the cases the situation was avoidable.

3. Due attention to the matter of visual acuity and color perception by those conducting the preliminary physical examinations could have reduced the number of rejections from 412 to 142.

Current Data

A preliminary analysis was made of all enlisted submarine physical examinations conducted by the Submarine Medical Center on personnel reporting to Submarine School during the calendar year 1964. Of 6963 examinations 769 (11%) were found not to meet the current physical standards for submarine duty. The reasons for disqualifications are listed in Table 1.

TABLE 1
PERCENTAGE OF ENLISTED PHYSICAL DROPS

Disqualifying Defects	Jan-Aug 1960	Jan-Dec 1964
Visual Acuity	32.0*	36.3**
Tank/Pressure Failure	20.3	13.0
Psychiatric	15.0	25.5
Respiratory	14.0	3.0
Auditory	12.4	5.6
Color Vision	6.0	5.3
Dental	0.3	1.7
Obesity	—	4.6
Skin	—	1.5
Cardio-vascular	—	1.4
Gastro-intestinal	—	1.3
Other	—	0.8
TOTAL Number of Drops	266	769
TOTAL Number Examined	3715	6963
% Drops/Number Examined	7%	11%

*Does not include 60 waivers granted by the Bureau of Naval Personnel.

**Does not include 92 waivers granted locally in accordance with Article 10.12e, Enlisted Transfer Manual.

The information in Table 2 was collected in an effort to find out the source of the physical drops. This information was obtained from a questionnaire completed at the time a subject was disqualified, (August-December 1964). The following questions were included:

1. Previous command?
2. Is there a preliminary submarine physical examination in the man's health record?
3. Was he found qualified by preliminary examination?

A sample of 200 physical disqualifications and questionnaires was reviewed. It is the impression of the examining staff that the sample of 200 is representative of the current trend. A study in 1965 will include all subjects reporting to Submarine School, and all physical drops from each command. The statistical limitations of Table 2 are well recognized.

Table 1 reveals an increase in physical drops per total enlisted men examined, from 7% in 1960 to 11% in 1964. The greatest number of persons was dropped because of defective visual acuity (32% in 1960 and 36% in 1964, of all physical drops). Almost all of these drops should have been detected at their previous duty stations, since they were gross visual defects. Some borderline and all waiverable cases were given a waiver and are not included in the drop figures. All color vision drops should have been detected by a properly administered Farnsworth Lantern test or one of the pseudo-isochromatic plate test sets.

Other defects that should have been detected during the preliminary physical examination are: auditory, dental, obesity, cardio-vascular, and gastro-intestinal. Some defects, such as respiratory, borderline obesity, skin, and the group listed as "others" require an opinion of the individual examining medical officer. This will lead to reasonable differences of opinion as to the man's qualification.

It is recognized that a general service medical officer cannot be expected to determine whether a candidate is psychologically adaptable for submarine duty. It is also recognized that Article 15–29(a), Manual of the Medical Department, states that the psychiatric portion of the examination may be omitted if the services of a trained examiner are not available; however, most of the psychological drops came from the larger centers where this service is usually available. They should have been disqualified during their preliminary submarine physical examination. Most of the cases classified as "Escape Training Tank or pressure test failures" could have been screened psychologically or administratively at their previous command. The majority of them refused further tank or pressure training after one or more attempts to pass the test. Some admitted fear of water or confinement, poor motivation for submarine duty, or volunteering to obtain a transfer from a duty station. Others had a history of repeated disciplinary action or evidence

TABLE 2

SOURCE OF ENLISTED PHYSICAL DROPS AND CONDITION OF HEALTH RECORDS

Previous Commands	Number of Physical Drops	Preliminary Physical Exams *NOT* in Health Record	Preliminary Physical Exam Present in Health Record	Found Qualified in Preliminary Physical Exam
A	93	81	12	12
B	36	13	23	23
C	18	12	6	5
D	12	0	12	9
E	10	0	10	10
F	10	7	3	3
G	6	1	5	5
H	5	1	4	4
I	5	1	4	4
J	3	0	3	2
K	2	0	2	2
TOTAL	200	116	84	79

of emotional instability or maturity. Very few were dropped for purely medical reasons, e.g., inability to equalize pressure within the middle ear or sinuses.

Most of the physical drops in Table 2 came from the larger recruiting areas. This table also reveals a recurring problem: the large number of personnel reporting to Submarine School without a report of a preliminary submarine physical examination in their health records. Of the physical drops who did have a physical examination in their health record, almost all of them were found qualified by their previous command. In some cases the health records contained entries to the effect that the candidates were not qualified for submarine duty. In spite of this fact, they were ordered to Submarine School.

Conclusions

1. There has been an increase in the percentage of rejections for physical reasons among the candidates for the Basic Enlisted Submarine course.

2. Due to inadequate preliminary submarine physical examinations during the calendar year 1964, the Navy was deprived of at least the equivalent number of six Polaris submarine crews or seven conventional submarine crews.

3. The needless cost of transportation, loss of service, incomplete quota of classes and morale problems are obvious and in most cases avoidable.

Recommendations

1. Information regarding the necessity for accuracy, consequences of inadequate examinations, proper methods of examinations, use of proper equipment, and familiarity with current submarine physical standards should be disseminated and stressed.

2. The problem must be corrected at local commands. Advice should be sought by examining activities from the Bureau of Medicine and Surgery or the Submarine Medical Center.

3. Cooperation is requested not only from examining medical officers and hospital corpsmen, but from recruiters and personnel officers, especially at Naval Training Centers and Reserve Training Centers.

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FROM THE NOTE BOOK

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY

All candidates who will have completed an approved progressive residency training program by 30 June 1966 will be eligible to apply for the Part I (written) examination of this Board to be given in July 1966. Applications will be accepted in the Board office only during the months of January and February.

Current Bulletins and application forms may be obtained by writing to the Office of the Secretary, Clyde L. Randall MD, 100 Meadow Road, Buffalo, New York 14216.

Diplomates of this Board are requested to inform the Secretary's office of any change of address.—Code 3162, BuMed.

CORTICOSTEROIDS

Cataracts

An incidence of 60 percent posterior subcapsular cataract was found in 58 arthritic patients being treated with triamcinolone acetonide. Since the majority of patients had received other steroids prior to the initiation of instramuscular triamcinolone acetonide therapy the exact stage of cataract initiation could not be determined. It was quite evident, however, that the greater the total amount of steroid received by the patient, the higher the incidence of cataract formation. —Spencer & Andelman (Tulsa, Okla), Arch Ophthalmology 74: 38, July 1965. Republished from CLIN-ALERT®, No. 188, July 17, 1965, by permission of Science Editors, Inc.

HEPARIN

Altered Bone Metabolism

A. *Osteoporosis:* Six of 10 patients receiving sodium heparin in daily doses of 15,000 to 30,000 units for six months or longer suffered spontaneous fractures of vertebrae or ribs. Biopsies disclosed soft, bony matrix. Osseous complications were not encountered in 107 patients who received 10,000 units or less sodium heparin once daily for one to fifteen years. Heparin may have a direct stimulatory

effect on bone resorption. The critical factor in heparin-induced osteoporosis seems to be the dosage level and not the duration of treatment. Further studies will be required to determine whether 10,000 units heparin daily is always a safe regimen.—Griffith et al. (Los Angeles, Calif.) JAMA 193: 91, July 12, 1965. — Republished from CLIN-ALERT®, No. 199, July 27, 1965, by permission of Science Editors, Inc.

BARIUM ENEMA
Hazards

The barium enema examination represents a distinct hazard in older patients with a previous history of heart disease. This conclusion was reached after 10 of 62 patients (all had a history of previous heart disease) showed electrocardiographic changes while undergoing routine barium enema examinations. Ischemic RS–T depressions occurred in 6 of the 10 patients. Three patients had arrhythmias or conduction defects, including one with paroxysmal atrial tachycardia during evacuation. Another patient had coupled ventricular premature contractions and a second-degree block during evacuation. A third patient showed nodal rhythm also during evacuation. The latter patient died after developing arrhythmia. One patient who showed RS–T segment depressions also showed a significant rise in serum transaminase activity. Studies are in progress to elucidate the mechanism of ECG changes observed in patients undergoing barium enema examinations.—Berman et al. (Newark, N. J.) J Am Geriat Soc 13: 672, July 1965. Republished from CLIN-ALERT®, No. 201, July 27, 1965, by permission of Science Editors, Inc.

DENTAL SECTION

NAVAL DENTAL RESEARCH REPORTS

Continuing the plan followed in recent issues of the *U.S. Navy Medical News Letter,* this issue presents abstracts of the fifth and sixth report of the Naval Dental Corps' intramural research program, presented at the 43rd General Meeting of the International Association for Dental Research. These two reports are on phases of the continuing clinical research on caries-free recruits at the U.S. Naval Dental Research Facility, U.S.N.T.C., Great Lakes. The research background of LCDR H. J. Keene, DC USN, was presented with the fourth abstract of this series. B. L. Lamberts, Ph.D. (Biochemistry) and I. L. Shklair, Ph.D. (Microbiology) are civilian scientists on the staff of D. R. F., Great Lakes. These scientists contribute greatly to the program both in scientific depth and in research continuity with the naval dental officers assigned tours of duty at DRF, Great Lakes.

ON EVALUATION OF CARIES ACTIVITY IN CARIES RESISTANT NAVAL RECRUITS

I. L. Shklair and H. J. Keene, Dental Research Facility, Great Lakes, Illinois.

During a one year observation period, 28 naval personnel who had no history of dental decay upon entering military service had paraffin stimulated whole saliva collected every 2 weeks. The salivary lactobacilli counts, aerobic streptococci counts, Snyders test, reductase activity, and percentage of salivary sediment were correlated with monthly clinical and roentgenographic examinations of the subjects. Fourteen of the men remained caries free and 14 developed one or more lesions during the year. With the exception of the streptococcal counts, the mean data obtained from all the tests were significantly higher in the group developing caries than in the group which remained caries free. The data obtained from the carious group before and after the initial carious lesion developed, were also compared to the data of the group that remained caries free. In the caries group the prelesion lactobacilli counts, Snyders test, and percent of salivary sediment data were significantly greater than in the group that remained caries free. The postlesion data were all significantly higher than that of the carious free group.

PAROTID SALIVA AMYLASE ACTIVITY IN A CARIES RESISTANT GROUP OF NAVAL RECRUITS

B. L. Lamberts and H. J. Keene, Dental Research Facility, Great Lakes, Illinois.

Paraffin-stimulated parotid salvia was collected for 20-minute periods at 2-week intervals for one year from 24 naval recruits who had no history of dental

caries at the beginning of the study. The volume of each saliva collection was measured and amylase activity was determined both in units per ml. and in units secreted per minute. During the one-year period, 13 of the 24 subjects developed one or more carious lesions. Comparisons of mean amylase values were made between the caries-free and the caries-active groups and within each group to determine the possible influence of seasonal average temperature extremes, time of day of saliva collection, and length of time in study. The mean amylase activity in units secreted per minute for the caries-free group was significantly higher than the mean activity for the caries-active group. The mean activity in units per ml. was also higher in the caries-free group, although this difference between the two groups was not significant. An analysis of the possible influence on amylase activity of seasonal average temperature extremes, time of day of collection, and length of time in study showed similar trends within each group; however, the influence of these variables on amylase activity was not significant.

XANTHELASMA: CURBSTONE RECOGNITION OF DYSLIPIDOSIS

Frederick A. J. Kingery, MD, University of Oregon, Portland, JAMA 193: 439, Aug 9, 1965.

Everybody recognizes xanthelasma. The yellow plaques which occur about the eyelids command immediate notice on the most cursory extraoral examination.

Individuals with essential familial hypercholesteremia usually develop xanthelasma at an early age. In addition, patients with other hypercholesteremic disorders such as xanthomatous biliary cirrhosis or hemachromatosis similarly present these lesions. Much less commonly, the patient with hyperlipemia (idiopathic or secondary to pancreatitis, diabetes, or von Gierke's disease) may exhibit xanthelasma.

Only 50% of adults with xanthelasma have demonstrable hypercholesteremia. This figure varies inversely with the age of the patient; 100% of children with xanthelasma are hypercholesteremic.

Since xanthelasma may herald a systemic metabolic disorder, it should not be treated only as a cosmetic nuisance.

(Abstracted by: LCDR William K. Bottomley, DC USN.)

EFFECT OF HIGH SPEED BONE CUTTING WITHOUT THE USE OF WATER COOLANT

Hall, R.M., Oral Surg, Oral Med & Oral Path 20(2): 150–153, August 1965.

The author describes animal experiments followed up by histologic sectioning of the operative sites in which a "light touch" was employed in the use of ultra high speeds for bone cutting. With the premise that high speed bone cutting in conjunction with the use of water spray coolants causes backsplash and contamination of a sterile field, the article describes usage without a water spray coolant. A "proper light touch" employed with an ultra speed bone cutting instrument without thermal necrosis of adjacent bone cells is claimed.

PERSONNEL AND PROFESSIONAL NOTES

Dental Corps Celebrates 53rd Anniversary. The following messages are typical of the many congratulations received in behalf of all the UNITED STATES NAVAL DENTAL CORPS personnel:

On the occasion of the fifty-third anniversary of the U.S. Naval Dental Corps, it is gratifying to review the outstanding accomplishments of this unique organization.

From the major shore-based clinics to the mobile units afloat, the support rendered by this corps has been consistently outstanding.

Congratulations on your anniversary and my personal thanks for your continuing support.

—FROM CINCLANTFLT

For fifty-three years the care and dedicated workmanship of the U.S. Navy Dental Corps has been a vital service to all marines during peace and war.

The efforts of Navy dentists who have worked under extremely adverse conditions in all our wars have not gone unnoticed by commanders charged with the responsibility of keeping marines in fighting trim, and the thousands of marines who have been treated expertly often under less than ideal conditions, are grateful for the care provided.

You are continuing to fulfill the mission of the Dental Corps in the highest traditions of the naval service by eradicating dental problems on the spot and keeping our marines pain free and on the line.

Congratulations and Happy Anniversary.

—FROM: ADMINO FMFPAC

CDR Jack D. Mahoney, DC USN, Saves Child

From Drowning. Ephiam Adams, a three-year old Vallejo, California, boy was rescued from almost certain death by drowning by CDR Jack D. Mahoney, DC USN, on duty at the Mare Island Navy Yard Dental Department.

Doctor Mahoney plunged into a muddy duck pond, recovered the boy, and began mouth-to-mouth resuscitation. He responded to this emergency treatment in a few minutes and was released from the Vallejo General Hospital a few hours later.

The event occurred on August 7, 1965.

Dental Officer Presentations. CAPT S. R. Howell, DC USN, 15th Naval District Dental Officer, presented a clinic entitled Construction of Post or Dowel Crown before the Congreso Dental meeting of the Asociacion Odontologica Panamena on 25 April 1965 in David, Republic of Panama.

On 6 June 1965, CAPT Howell was elevated to President of the Canal Zone Dental Society. Assisting the new president are CDR R. P. Hylton Jr., DC USN as Secretary-Treasurer, and LCDR L. E. Slagle, DC USN, Program Chairman. The Canal Zone Dental Society is a constituent of the American Dental Association and CAPT Howell will again be a Delegate to the ADA convention in November.

It is interesting to note that dental officers of the Naval Station, Rodman, Canal Zone have been participating in an Air Force sponsored people-to-people type program. LCDR L. E. Slagle, DC USN, recently accompanied the 605th Commando Medical Team, USAF into remote areas of Panama. CDR R. P. Hylton Jr., DC USN, has accompanied the same team to interior areas of Panama and spent a week and one half with the School of Latin America USAF Medical Team to various areas in the Republic of Guatemala.

On these trips, the dental emphasis was on diagnosis and oral surgery. Several hundred teeth were extracted, and for many of the patients, this was the first dental experience. The general appreciation expressed more than justified the efforts of these medical teams, whose work not only served a humanitarian purpose but added another step forward along the path of enhancing the American image abroad.

Navy Dental Officer Reviews Recruit Graduation. CAPT M. G. Turner, DC USN, Dental Officer, Administrative Command, U.S. Naval Training Center, Great Lakes, Illinois, recently served as reviewing officer for a 1000 man brigade of graduating naval recruits at the training center.

A native of Ohio, CAPT Turner received his pre-

CAPT Turner

dental education at Ohio State University. He graduated from the College of Dentistry at Ohio State in 1936. He was commissioned in the Dental Corps on August 15, 1938. CAPT Turner is a diplomate of the American Board of Prosthodontics; a fellow of the American College of Dentists; a member of the American Dental Association; a member of the American Prosthodontic Society and a fellow of the American Association for the Advancement of Science.

He is married to the former Kathleen Trainer of Columbus, Ohio. They have two children, Jeffrey, 21 and Jonathan, 15.

Oral Cancer. A New York Dental educator has urged increased emphasis on instructing dental students in the early diagnosis and treatment of oral cancer. "It is realized that oral malignancy is one of the few potentially fatal diseases that the dentist may be called upon to recognize and to diagnose," said Dr. Alan J. Drinnan of Buffalo, N. Y.

In the United States about 20,000 persons will be found to have oral cancer this year. Of these, only one out of three will be alive at the end of five years. Dr. Drinnen, who is visiting assistant professor of the department of oral diagnosis and clinical pathology, State University of New York at Buffalo dental school, reported on a special program in oral oncology at his school. The program consists of a series of formal lectures, clinical demonstrations, hospital visits, tumor board attendances and the preparation of a short paper by the students on some aspects of oral oncology.—ADA News Letter 18(16): 3 August 2, 1965.

Domestic Water Softeners Do Not Cut Fluoride Content of water in cities where the chemical has been added to supplies. Dr. Gerald J. Cox, professor of dental research at Pittsburgh University's dental school, says that he frequently receives questions concerning the effect of water softeners on fluoridated water. Writing in the Odontological Bulletin of Western Pennsylvania, Dr. Cox says: "There is no pick up of fluoride by the zeolite softeners and thus the soft water has *substantially the same* fluoride content as that supplied by the community water".—Water Newsletter 7(15): 1, August 9, 1965. Copyright by Water Information Center Incorporated. Reprinted by permission.

LIST OF NEWLY STANDARDIZED ITEMS AVAILABLE FOR ISSUE

FSN	*NOMENCLATURE*	*UNIT*	*PRICE*
6520–074–4947	Mouthpiece, Saliva Ejector, Dental	EA	2.60
6520–226–0253	Strip, Assortment, Abrasive Dental, Flint, Coarse Grit, 100s	BX	.82
6520–226–0254	Strip Assortment, Abrasive Dental, Flint, Fine Grit, 100s	BX	.82
6520–226–0255	Strip Assortment, Abrasive Dental, Flint, Medium Grit, 100s	BX	.82
6520–890–1864	Gingival Retraction Cord, Impregnated, Dental, 4 Ply	PG	1.70
6520–890–1865	Gingival Retraction Cord, Impregnated, Dental, 2 Ply	PG	1.70
6520–890–1871	Dispenser, Dental Floss, Metal	EA	3.10
6520–965–0004	Wheel, Abrasive, Diamond, Friction Grip Angle Handpiece, Ball, High Speed, 0.065 inch Diameter	EA	.59
6520–965–0005	Wheel, Abrasive, Diamond, Friction Grip Angle Handpiece, Flame Shaped, High Speed, 0.045 inch Diameter	EA	.62
6520–965–0007	Wheel, Abrasive, Diamond, Friction Grip Angle Handpiece, Cylinder, High Speed, 0.050″ by 0.165″	EA	.62
6520–965–0008	Wheel, Abrasive, Diamond, Friction Grip Angle Handpiece, Cylinder, High Speed, 0.055″ by 0.245″	EA	.66
6520–965–0010	Wheel Abrasive, Diamond, Friction Grip Angle Handpiece, Inverted Cone, High Speed, 0.060 inch Diameter.	EA	.62

OCCUPATIONAL MEDICINE SECTION

THE ROLE OF OPTOMETRY WITHIN THE NAVAL INDUSTRIAL ESTABLISHMENT

B. L. Newman, LCDR O.D. MSC USN, NAS Memphis, Reprinted from American Industrial Hygiene Association Journal 25, 507–512, Sept–Oct 1964.

The naval establishment, and in particular the Office of Industrial Relations and the Bureau of Medicine and Surgery, have long recognized the importance of a Sight Conservation Program for industrial civilian employees of the Navy Department. This is especially true as it pertains to those personnel employed at major shipyards and ship repair facilities and to those employed at air stations where complete overhaul and repair departments are in operation. The policy governing the Naval Sight Conservation Program has been set forth in various succeeding Naval Civilian Personnel Instructions(NCPI) and the program's purpose, as interpreted generally, is: (a) to eliminate eye in-

juries, (b) to eliminate accidents resulting from faulty vision, (c) to increase production and eliminate waste resulting from defective vision, and (d) to foster and improve employee morale.

Completely in agreement and conforming with these stated purposes is the official policy of the American Optometric Association regarding industrial vision. Condensed to a basic statement of policy, the official viewpoint states that the profession recognizes that industrial management has a deep concern for the visual welfare of its employees and also a deep concern for the manner in which visual enhancement affects job performance, safety, increased production, and reduction of waste and inefficiency. As a profession dedicated to the guardianship of human vision, optometry is constantly reevaluating its responsibility to industry and pledges itself to a continued program of study and research in the field of industrial vision and sight conservation. Individual members of the profession, almost to a man, subscribe wholeheartedly to this official policy.

In relation to its civilian industrial employees, the Navy finds itself in the role of industrial management and this on a very large scale. As regards the field of sight conservation, a significant aspect of the important emphasis that is placed on this field is shown by the fact that, despite a slight shortage in the number of service optometrists in the Navy at present, those who are in industrial billets have not been transferred to fill any other military demands. It is reported by competent authority that at any large naval industrial facility between 120–130 eye injuries may be treated in a given year. The prevention of such injuries to the greatest extent possible and the provision of appropriate safety spectacles constitutes a most important program on the part of Navy management. To supervise such programs and act in the capacity of visual consultant, the Navy has called upon the services of many optometrists, both civilian and military.

Optometry has played a most significant role in pioneering industrial vision programs and has been active in research to lay the basic foundation of statistics and factual information which more than justifies the existence of any sight conservation program. To present this justification before both management and labor, optometry has borrowed some axioms which have long been accepted in labor-management relations. The developing of moral and company loyalty is a major element of industrial relations. Most authorities agree that job enthusiasm is brought about by mutual understanding between management and labor. Management must create the idea that it is vitally interested in the general well-being of the individual as well as his job performance. The small, but important extras that help make life on the job more pleasant and compatible have a value far beyond the cost. Optometry in its presentation to industry of proposed services as regards a vision program maintains that the examining of eyes of all employees once a year, pointing out the possibility of permanent injury affecting later earnings and detection of other physical disabilities, earns well deserved, grateful appreciation from employees.

Employee safety and accident reduction is always a foremost consideration of management and optometry has time and again used this accepted axiom in pointing out advantages of a well organized vision program. The problems attached to incurred injuries to the eyes and other parts of the body are by no means new. It brings this interesting observation that pirates and buccaneers preying on Spanish shipping in the 17th and 18th centuries developed a system of compensation predicated upon the theory of wage loss in case a pirate sustained an injury aboard ship. The compensation depended entirely upon whether any prize was captured but, assuming that it was, the plan worked like this. The captain and ship's surgeon were paid their previously agreed upon percentage and then, before any of the crew shared in the booty, compensation cases were paid. Loss of right arm—600 pieces of eight and six slaves. Loss of left arm or of right leg—500 pieces of eight and five slaves. Loss of left leg—400 pieces of eight and four slaves. Loss of an eye—100 pieces of eight and one slave. Since brawn and agility were more important in that age than excellent vision, the established values were probably in about the correct relationship. With the changing of times, however, emphasis has also changed to the point where now, along with the necessity for good health, good vision is an extremely valuable possession and worth every precaution to safeguard. This is the philosophy of optometry in industry as well as in all other pursuits.

While insurance costs, lost time of the injured worker, and compensation payments are important, they are not the only costs of accidents. There is a popular acceptance that direct costs represent only about one-fourth of the indirect costs of accidents in industry. It is a certainty that officials within the Navy's industrial organization will corroborate the facts that such items as machine stoppage, material

spoilage, machine damage, idle time of men on nearby machines to stop to help or watch, time consumed in taking the injured to a place of treatment, legal costs, and time spent away from their jobs by those concerned testifying in compensation hearings all add to the costs of accidents.

Statistical Background

Optometry has been able to tie in these vital facts with some statistics to show how improved vision for employees results in fewer accidents. For example, a certain textile mill found that among its employees who were accident-free, 79% had adequate vision to perform their jobs efficiently. As opposed to this, the firm found that of its employees who had been involved in one or more accidents on the job, only 38% of them had adequate vision for their jobs. A forge shop found its workers whose tests revealed inadequate visual skills had 34% more individuals with six or more visits to the first aid station when compared to the group with adequate visual skills. A tractor manufacturing plant found that 96% of employees with good safety records also possessed excellent vision. On the other side of the ledger was the fact that 61% of their accident repeaters were found to have sub-standard vision.

A very close relationship existing between the task of personnel selection and adequate employee vision has been brought to light by optometric research and case histories. The use of visual screening instruments at the Navy's various civilian employment offices is ample evidence that it recognizes this relationship. In selection of personnel, the Navy's industrial relations policy is to find workers who will acclimate easily, be easily trained and work productively. No employer would consider placing a 100-pound man on a job lifting a 150-pound weight. It is just as foolish to consider a prospect with poor, defective visual coordination for a position requiring top visual quality. This type of improper placement will result in an employee who is neither happy nor productive. A clothes manufacturer reports of a woman who applied for a job. She had been termed a poor producer and highly indifferent to her work by her former employer. To all intents and purposes, she appeared to be a very poor employment risk. Her pre-employment visual tests revealed a lateral imbalance and a cause of intense discomfort. She was subsequently examined for a lens prescription, fitted, later employed and her record now shows an excellent attitude, efficiency on her job and high productivity.

Ascertaining the quality of an employee's visual skills lends immeasurable aid to some problems that arise in connection with personnel training. A manufacturer of zippers was having a difficult time in training workers for his inspection department. The job entailed the inspection of the finished zippers for imperfections in the various ridges. An analysis of the task revealed that superior depth perception was essential for successful performance. The training problem completely vanished when visual testing weeded out those trainees who had deficient depth perception.

In its most recent annual review on industrial optometry the American Optometric Association cited a few outstanding examples of the relationship between good employee vision and waste control. The prevention of waste can be controlled only by eliminating many factors. In one of these factors, poor workmanship and damage in the handling of materials, visual defects play a great part. An automotive parts producer found that of the grinders in his employment who met or excelled the standard visual requirements, only 21% had 5% or more scrap material in his work. This was contrasted with 55% of the grinders who had sub-standard visual abilities having 5% or more scrap in their operation. A machinery manufacturer found a 10% reduction in scrap losses after the installation of an industrial vision program at his plant. An electronics equipment builder found a 22% rejection rate among his workers with inadequate vision as opposed to only an 8% rejection rate among his workers whose vision was rated adequate. A large chain company discovered that in the first year following the installation of a vision program its scrap was 20,000 pounds less than the previous year and this was despite a substantial increase in production.

The citing of these examples and others and the compiling of current up-to-date data concerning them is valid evidence that the profession of optometry is striving to be ever alert to increased services which it can offer and perform for management. The Navy's utilization of these services throughout its various industrial activities is paying gratifying dividends in fostering higher performance in safety, employee relations, personnel selection and training, increased production and decreased waste. The savings from a budgetary standpoint as related to the Navy's Sight Conservation have been immense, although it is next to impossible to ascertain exact figures. The reason for this is obvious. A comprehensive industrial vision program such as the Navy employs has such far-reaching advantages and

beneficial effects on both sides of the fence (i.e., labor and management), both direct and indirect, that to attempt a monetary estimate of their value would be an astronomical task.

What Constitutes Visual Skills?

At this point, it is appropriate that a discussion on the actual mechanics of vision testing be introduced. The question may well be asked, what specific tests are necessary for industry in general. Vision tests are classified in two ways: (1) the distance at which the test is given, and (2) the visual skill being checked. Under the heading of "Distance", two distances are important. The first is 20 feet and beyond, often referred to as infinity for practical purposes. The second is the working distance and this, of course, will vary with different job operations. The average is around 16 to 20 inches, but, in the final analysis, this working distance should be computed as near the exact figure as possible when prescribing corrective-protective eyewear for any given employee. Under the classification of "Vision Skills" there are five skills which should be checked—binocular coordination, visual acuity (both near and distant), field of vision, depth perception and color discrimination. Optometrists, because of the extensive studies which they have made in their specific curriculum of training on vision skill, are uniquely fitted to offer unparalleled professional guidance to the various industrial vision testing procedures. One pamphlet on industrial vision described for the layman just what is meant when each of these visual skill terms is used. Binocular coordination is the ability to make the two eyes work well together. Visual acuity is the ability to focus and see well at both twenty feet and beyond (infinity) and at near point. This skill is checked both binocularly and monocularly. Field of vision is the ability to discern both size and relative movements, if any, of objects on either side, above and below the observer when his vision is fixed on a small target directly in front of him. Depth perception is the ability to judge space relationships. Color discrimination is almost self-explanatory, i.e., to detect differences in color.

Some pertinent comments should follow these definitions at this point. Optometric research has determined from analysis of extensive accident records that in all types of jobs there are specific visual shortcomings which are most likely to lead to accidents. This is one reason why the profession stresses that the Snellen letter chart, read at 20 feet, is of little or no value as a test for vision for most industrial jobs. This is because most tasks requiring high visual efficiency are performed within arm's length and it is this near point that should receive critical attention when evaluating a worker's visual skills. Also, we should keep in mind that there is no such thing as "perfect vision." Some workers will excel in visual skills valuable for one type of job and some are superior for another. No one is ever above normal in all the complex occupational vision tests, but almost everyone is particularly proficient at some valuable skill. Inefficient vision does not need to be an occupational disadvantage. Visual capacities of workers can be matched to visual requirements of jobs to the advantage of the employee as well as to achieve greater production and safety. Even the blind can meet the requirements of output, efficiency, and safety in the right type of job.

Lighting Vs. Vision

Regarding the overall discussion of the various visual skills and, in particular, the skills of acuity and color discrimination, some mention should be made of lighting and color schemes that decorate a job area. As stated in a previous paper presented by the writer only in recent years has serious attention been given to proper illumination of a specific job area. Optometry has worked very closely with the American Society of Illuminating Engineers to develop in industry the prime conditions necessary for optimum illumination. In fact, the two groups are so closely joined that in practically every school of optometry today there is a student chapter of the I.E.S. organized to give the undergraduate optometrist a basic background in this field. It has been estimated that improper lighting is an important contributing cause in 20% of all industrial accidents. This is a serious indictment and one which should prompt all concerned to take such remedial steps as are necessary. Since vision is psychological as well as physiological, paint and light are extremely important in providing a good seeing environment.

Some questions follow which, if used as a rule of thumb, will point up any lighting or color scheme deficiencies within an industrial plant. Is there adequate light, particularly in critical work areas? (Adequate light is defined as "that suitable for a given performance . . . and adequacy and suitability depend upon the performer's capacity.") Is there freedom from disturbing shadows? Is there freedom from large areas which tire a worker's eyes when he happens to look up from his work? Is there minimum

glare? Are complementary shades of paint used to bring out desirable contrasts? Are light and paint utilized to their greatest potential in making work area surroundings as pleasant as possible? Lighting experts can readily illustrate how more kilowatt hours of electricity are consumed by inadequate and poorly planned lighting than good lighting which has been ingeniously engineered. Also, it is a well-known fact that, in many cases, proper shades of paint can substantially increase the effectiveness of existing light.

As far back as World War II, the Navy Department has recognized the professional skill and training possessed by optometrists and have placed in their trust added responsibility as the years have passed. Certain numbers of the profession were commissioned in the Hospital Corps and then, with the organizing of the Medical Service Corps, optometry was given its own separate section within the table of organization of the new corps. Acknowledging that the educational background of optometrists renders them uniquely qualified to act as visual consultants to the various Sight Conservation Programs on a local level as they are put into operation, The Department of the Navy through the Bureau of Medicine and Surgery is placing more optometrists in billets of this type.

The duties of an optometric industrial vision consultant are varied and complex. They have been outlined and given special emphasis by different authorities, but basically they can be condensed as those attached to rendering a complete visual service to the employee, both professionally and mechanically, and also to advise on the administration of a vision program to management. The methods by which optometrists accomplish this in the Navy compare very closely with the same services rendered to a civilian industry by a civilian practitioner. One advantageous exception to this is that the practitioner in the service, being salaried, usually is able to devote full time to his consultant duties, whereas his civilian counterpart might be performing only on a part-time basis.

Optometric Training and Services

The curriculum for the training of an optometrist requires two years of pre-optometric studies in the liberal arts and sciences. He then attends for three academic years in professional school, the latter including one and one-half years of interning in the school clinic. Some states require an additional internship with a private practitioner before a candidate can be eligible to take exams for a state license. While in professional school, in addition to such courses as ocular pathology, ocular anatomy, head and neck anatomy, visual optics and geometrical optics, the student is lectured at length on industrial vision and mechanical optics. These, together with courses in theory and application of optometric principles, give a graduate a well-grounded concept of the services involved in guiding a vision program toward the best productive benefits for both employee and management.

The services that the optometrist renders to the patient-employee in his role as consultant can be broken down into eight specific steps. Some of these steps offtimes take only seconds to accomplish but require years of training to be able to perform them. The first of these steps is examining—investigating the possible existence of potentially dangerous pathological anomalies. Secondly, the patient is refracted. This involves the scientific measuring of the ability to see clearly, comfortably, and efficiently. An analysis is made of the patient's refractive and binocular status. Third, there is the all-important service of prescribing. This is the recommending of certain remedial measures, especially taking into consideration the patient's occupational and visual requirements. This service also includes the careful preparation of professional conclusions and the instructions necessary for the successful improvement of visual abilities. Fourth is the service of prescription interpretation. This is one of those services previously referred to as taking only seconds to perform but must be done by one capably trained. This involves precise calculations and the translation of data into terms of a therapeutic device, plus the recording of detailed instructions for the optical laboratory to follow.

The fifth step is the service of verification, i.e., the confirmation of the accuracy of the finished safety glasses. This insures that the device meets the desired prescription specifications. The sixth step is fitting, or dispensing. This is the accurate positioning of lenses before the eyes and adapting the frame to the patient's particular facial contours for comfort, safety and efficient usage.

The seventh service is one of re-evaluation. This can best be described as the professional determination of the effectiveness of the patient's prescription lenses as positioned before the eyes. On first thought, these seven foregoing services should seem fairly complete and comprehensive, but an eighth one while seemingly minor in scope can certainly be major in its far-reaching effects on the successful management of any industrial vision program. And

in this eighth step is illustrated again how uniquely optometrists are so aptly qualified on the basis of their specialized training to render this particular service, i.e., the servicing of the safety-prescription spectacles. This service involves the readjustment and realignment at regular intervals of the safety eyewear so that on-the-job usage may impair neither the safety nor the corrective values of the spectacles.

Conclusions

While a great deal of the foregoing discussion has dealt with problems and their resolution as found in private industry, in each instance because of the vast size and scope of the industrial plant found within the Naval establishment, practically every situation can be found to exist within its widespread industrial complex. The vision programs as maintained by the Navy Department at its various industrial activities pursues the same primary objective as is common to any effort in preventive and industrial medicine, i.e., human maintenance. And this suggests five levels of prevention: (1) the promotion of health, (2) specific protection, (3) early diagnosis and treatment, (4) limitation of disability, and (5) rehabilitation. No program in the safety field so closely fits these five preventive concepts as the industrial vision program which the Navy operates for its civilian employees.

The Navy, through its optometry officers who are assigned to industrial billets as vision consultants, is constantly striving to administer an ever-increasingly effective vision program. It is designed in conformity with the pattern of preventive medicine, and so designed will prove to be an important factor toward good public health and modern safety management. This in turn will be benefiting the employee, management (Department of the Navy), the community, and, since the Navy is an agency of the Federal government, it will in no small measure benefit our national economy.

AN OLD POISON—A NEW METHOD

National Clearinghouse for Poison Control Centers, DHEW, PHS, Washington, D.C., pp. 3–4, May-June 1965.

It has been called to the attention of the National Clearinghouse that several articles have been published in garden columns and publications recommending that moth balls be dispersed on lawns and around shrubbery to discourage trespassing by wild and domestic animals. The effectiveness of this procedure is not confirmed but it does present a hazard to young children who might eat them while playing in the yard. We have reported on such accidents in the past.

Most of the reports of naphthalene reported to this office did not indicate any serious consequences from such ingestions. However, in individuals with a hereditary defect characterized by a low level of reduced glutathione there is a susceptability to red cell hemolysis when exposed to metabolites of naphthalene.

RESERVE SECTION

ANNUAL CONVENTION OF THE ASSOCIATION OF MILITARY SURGEONS

The Annual Convention of the Association of Military Surgeons will be held at the new Washington Hilton Hotel, Washington, D.C., on the 15th, 16th, and 17th of November 1965.

The Military program has been approved for retirement point credit for those eligible Navy Reserve Medical Department Officers in Attendance.

A representative of the Bureau of Medicine and Surgery will be available to record and report the attendance of eligible officers.—Code 361, BUMED.

DR. WILLIAM J. MILLS, JR. AWARDED LEGION OF MERIT

5 August 1965. Dr. William J. Mills, Jr., a Commander, Medical Corps, U.S. Naval Reserve, of Anchorage, Alaska, received the Navy's second highest peacetime award, the Legion of Merit, for his work in the field of cold weather injuries. (Ceremony originally scheduled on 2 August at Naval Station, Kodiak, Alaska was cancelled because of bad flying weather—Dr. Mills and party could not be landed at Kodiak—and was rescheduled for 5 August at Elmendorf Air Force Base, Anchorage.)

RADM R. E. Riera, USN, Commander Alaskan Sea Frontier and Commandant, Seventeenth Naval District, made the presentation in a ceremony held at Headquarters, Commander in Chief, Alaska, at Elmendorf Air Force Base, Anchorage, Alaska.

The Secretary of the Navy, acting on behalf of the President of the United States, had authorized this award pursuant to a recommendation by RADM Riera.

Dr. Mills, who lives at 1455 Hidden Lane, Anchorage, became intensely interested in the area of cold weather injuries as early as 1955. Such interest stemmed from his belief that simple freezing of an extremity should not necessarily cause the loss of the extremity by amputation, as was often the case during that time.

Dr. Mills has since conducted astute clinical investigations, almost singlehandedly, to study the effects of cold weather injuries upon the human body, with the prime objective of developing a more successful manner of treatment.

In one project involving more than two hundred cases of cold weather injury, acting either as attending physician or in consultation, he compiled valuable clinical data to assist in improving treatment methods.

Dr. Mills extended his research beyond clinical observations. Although an amputee himself since the loss of a leg in Pacific action during World War II, he has, during periods of active duty, accompanied ground forces on maneuvers in temperatures far below zero to treat patients of cold weather injury as well as to study the physiological effects of cold weather on the system.

By virtue of his study and practice, Dr. Mills has now reached the unique position of having examined and treated more of this type of patient than any other known physician in America.

His written contributions to medical science have proven invaluable and may be viewed through the countless papers, periodicals, and films which he has published.

The treatment developed by Dr. Mills involved a departure from the technique which had previously been used in treatment of cold weather injury and frostbite cases. Through intense observation, he discovered that too often the tendency was to amputate almost immediately the damaged extremities of patients who had suffered frostbite, thus resulting in further surgery as more tissue became affected.

He became convinced that surgery was being performed prematurely and that by waiting until the areas of damage became more clearly defined less surgery would be required.

He discovered that tissue damaged or destroyed by cold does not cause deterioration of adjacent healthy tissue as rapidly as previously believed, and that a "wait and see" technique often showed that much of the apparently damaged tissue could be saved.

His form of treatment for severe cold injury differed from the "chill" treatment then in use by utilizing a rapid thawing technique as a means of improving circulation in the affected areas. A detailed description of this treatment is published in the 1964 edition of "Current Therapy." His technique was proved successful in many of the two hundred patients attended.

The Mills technique has now been acclaimed by physicians throughout the NATO countries of Europe, where cold weather injury has long been a serious problem and has become the standard treatment in the U.S. military services. Dr. Mills performed a great deal of his research with funds provided by a Navy grant from the Office of Naval Research, but much was accomplished at his own expense.

Dr. Mills is held in high esteem by medical colleagues everywhere as a leader in his field, being a respected member of such organizations as the American Medical Association; American College of Surgeons (Fellow); International College of Surgeons (Fellow); Association of Military Surgeons; and American Academy of Orthopedic Surgery (Fellow); and many others.

Dr. Mills was born in San Francisco, July 7, 1918. He is married to Elaine Mary Mills. They have seven children. The doctor holds an AB degree from the University of California at Berkeley and an MD from the Stanford University Medical School.

He interned at the University of Michigan Hospital at Ann Arbor, was an assistant resident in general surgery there from 1950 until 1951, a resident orthopedic surgeon from 1952 to 1954 and has practiced orthopedic surgery in Anchorage since 1955.

OFFICIAL CITATION

"For exceptionally meritorious conduct in the performance of outstanding service for his contributions in the field of cold weather medicine and surgery. Commander Mills, a practicing Orthopedic Surgeon in Anchorage, Alaska, began extensive research into the problems of cold weather injuries approximately

ten years ago, inspired by a conviction that something more must be done to reduce the suffering and crippling effects of such injuries. Though suffering a physical handicap himself, he carried out painstaking clinical studies involving more than two hundred patients with cold weather injuries. Additionally, he spent his periods of active duty with troops on arctic maneuvers in temperatures far below zero to study the physiological effects of cold weather on the human body and to offer treatment. While a great deal of his work was performed with funds provided by a Navy grant from the Office of Naval Research, much was accomplished at his own expense and on his own initiative. The years of research by Dr. Mills have produced a completely new and more successful treatment of cold weather injury. His technique makes it possible to reduce the surgical procedures required in many cold weather injuries and has saved many patients the loss of one or more extremities. As an attest to his work, most of the European NATO nations, where cold weather injuries have always been a problem, have accepted his technique as standard treatment, and this same technique is now used in our Armed Forces. His work is expected to produce even greater results in future years. As a Medical Officer of the U.S. Naval Reserve, his contributions to cold weather medicine have brought great credit to himself and to the Medical Corps and have been in keeping with the highest traditions of the United States Navy."—News Release, Public Information Office, Kodiak, Alaska.

EDITORIAL DESK

ARTHROPOD-BORNE VIRAL ENCEPHALITIS (PART I)

A GENERAL REVIEW OF THE ENCEPHALITIDES, THEIR MODES OF TRANSMISSION AND RECENT EPIDEMIOLOGIC TRENDS

LT Norman M. Sawyer, MC USNR and DVCC Jacksonville, Fla Staff.

The term "virus" is established in the American vocabulary "the virus" is commonly accused as the cause of almost every transitory human (and perhaps animal) affection from the "cold" and flu respiratory spectrum to the gastrointestinal disturbances of nausea, vomiting, and diarrhea.

Although frequently not specifically identified, in general, viruses *are* guilty of these acute, short-term, prostrating illnesses, and except for the danger of dehydration and high temperatures in the very young and old, are usually no threat to well-being either during or after infection.

However, there are well-known viruses that are not so benign in their attack upon the human. Mumps, measles, and chickenpox are "the usual childhood" varieties of virus ills that can certainly cause consternation. Yellow fever and smallpox are dreaded viral diseases of considerable malevolence.

The concern here is with viral diseases that not only cause the high fevers and prostration typical of systemic viral disease, but also have a strong tendency to invade the central nervous system (the brain and its lower centers, and the spinal cord), and to inflame the covering surrounding these structures (the meninges). Inflammation of the central nervous system at brain level is called *encephalitis;* of the spinal cord, *myelitis;* of the meningeal covering, *meningitis;* and of all three, *meningoencephalomyelitis.*

The list of encephalitogenic viral diseases is growing steadily; they are now reported from every inhabited part of the world where temperate or higher temperatures prevail. They will be discussed later in some detail.

Encephalitis—After inoculation of the virus into the blood stream (by mosquito or tick, if arthropod-borne), there is an incubation period of from 5 to 15 or more days before the clinical picture of disease appears. This is supposedly the time necessary for the disease agent to invade the target tissues, in this case the central nervous system, where inflammatory swelling takes place chiefly in the more vital areas of gray matter, of the brain and spinal cord. The meninges may also become inflamed. If the infection is particularly light, the patient may suffer part or all of the typical syndrome of acute headache, fever, myalgia, malaise, stiff neck, and gastrointestinal upset. Recovery is rapid and complete. If not a

part of an epidemic, such a case would be difficult to diagnose correctly without a thorough laboratory work-up; many such cases are undoubtedly treated palliatively every year and not suspected or recorded as arthropod-borne virus induced. These abortive infections usually confer immunity to the particular viral agent involved.

More serious invasion results in considerable brain tissue edema and engorgement of the smaller vessels of the brain causing focal hemorrhages into vital control areas with brain or cord cell death. The onset is rapid, and depending on the extent of infection, swiftly progresses to nervous irritability and restlessness, general or local convulsions, varieties of muscle paralysis of the limbs, jaw, or eyes, loss of bowel and urine control, staggering, anesthesia, delerium, coma, and death characterize the picture of full-blown meningoencephalomyelitis.

Neurologic handicap from encephalitis is not uncommon, and can involve any bodily function controlled by the central nervous system. Mental retardation, paralyses, speech disorders, convulsive attacks, and parkinsonism may appear anytime during or after infection and may be permanent. There is some evidence suggesting that chronic, smouldering viral activity may persist long after the patient returns to clinical health, causing such sequelae as parkinsonism to develop slowly and appear late.

In a child, encephalitis may be a far greater catastrophe than the same condition in an adult, owing to the rapid growth and development of the central nervous system in childhood; and the incidence of serious neurologic sequelae is high following almost all varieties of encephalitis in the young. These sequelae are unrelated to the severity of the acute disease and may be manifested only after months or even years have elapsed.

A single arthropod-borne (arbovirus) illness, abortive or full blown, usually, but not always, confers life-long immunity to the infecting strain of virus, and in some cases of immunologic similarity among the strains, e.g., tick-borne encephalitides, cross immunity may exist.

There are no specific drugs to combat any of the viral encephalitides. The treatment in all is aimed at comfort for the patient, reduction of convulsions with sedation, lowering of temperature, and maintenance of hydration.

Viruses—This agent of many diseases is an extremely small entity whose nature is not definitely known. It can be visualized and its dimensions measured by electron microscope techniques that show them to range greatly in size from the smallest of 10—28 millimicrons (one millimicron—mμ—is one ten-millionth of a centimeter) such as the polio and Japanese B encephalitis viruses to the largest known 225—400 mμ diameter of the vaccinia virus with an unbroken continuum of sizes between these extremes. Some of the smaller viruses are of about the same size as the more complex molecules of the blood serum; the largest are nearly the size of living bacteria. Their structures are now only hypothetical.

No satisfactory method has evolved to determine whether the virus is a living entity or not, some of its behaviorisms resembling those of bacteria, and others appearing to have inert molecular characteristics. They do not thrive, so far as is known, outside a living cell so that they must invade the cell under proper conditions in order to survive and multiply. The basis of viral "life", therefore, seems to be host-dependent, and the virus a total parasite.

The arthropod-borne viruses (Arboviruses) comprise an ever-growing list of more than 150 specific disease entities which are classified for convenience into 3 main clinical syndromes outlined below, and into several subgroups on the basis of biochemical and immunologic similarity by laboratory methods. Because the clinical picture of illness in all of these may be identical, it is mainly by laboratory means that a particular virus causing an outbreak can be isolated and identified with certainty.

1. *Encephalitis* is the syndrome of foremost importance. Its mild to overwhelming spectrum and unfortunate sequelae in the human have been described earlier.

There are about 15 apparently distinct arboviruses causing encephalitis with or without the kinds of complicating fevers described below. Ten of these are mosquito-borne and are encountered chiefly in the United States, excepting northern New England (Eastern, Western and St. Louis encephalitides), the western Pacific and Far Eastern areas (Japanese B and others), and in Australia and New Guinea (Murray Valley encephalitis). Japanese B and Murray Valley types are important as disease threats to our armed forces in these areas.

The mosquito-borne California virus is in a separate "California group", and has caused encephalitis in several cases with 1 infant death over the relatively few years of its known existence. It has been isolated or serotyped from the *Aedes* and *Culex* vectors and from large and small animals in the San Joaquin Valley, Mont., Mich. and Ohio.

In general, the mosquito-borne infections tend to *occur* in temperate latitudes in summer and early fall, commonly limited to years of high temperatures,

heavy rainfall, and large mosquito populations. They tend to *persist* endemically in hot, irrigated valley regions and only irregularly in dry farming areas. Entomologists can also pinpoint areas of seemingly permanent mosquito arbovirus reservoirs such as certain cedar bogs in eastern Mass. for the Eastern encephalitis; the Miss., Ohio, and Rio Grande River Valleys and areas of southern Fla. for the St. Louis type; and in Kern City, Calif. for the Western type.

The rest of the important arbovirus encephalitides are tick-borne. With the exception of the Powassan virus endemic to southeastern Canada and areas of the northern United States and Colorado Tick Fever, which is prevalent in western United States, they are chiefly diseases of the USSR, areas of eastern and central Europe, Scandinavia, and the British Isles.

2. The other 2 arbovirus syndromes are the plain "benign" *fevers,* the best known being Dengue, the painful "break-bone fever" and the *hemorrhagic fevers,* well known in the form of Yellow Fever and in the more severe forms of Dengue. In this group, tissue destruction of the liver, spleen, small intestine and stomach by viral invasion can lead to considerable internal hemorrhage and the black vomitus (digested blood) characteristic of fulminant Yellow Fever.

Encephalitis is an uncommon complication in these 2 forms of intense fevers, but it should be remembered that any systemic viral infection may possibly involve some part of the central nervous system with serious results.

Arbovirus vectors, hosts, and reservoirs—In the Americas, the western Pacific, and in the Orient the arbovirus is transmitted chiefly by the mosquito; in Europe and the USSR, the tick seems to be the principal vector. This is a rough geographic distribution, and areas of overlap are common and large.

The mosquitoes most responsible for outbreaks of encephalitis, generally, seem to belong to the Culex genus.

Culex tarsalis is found anywhere west of the Mississippi from southern Canada to Mexico, and is the most important vector of encephalitis in the west. It feeds chiefly on birds, infecting itself and other birds. It carries the viruses of St. Louis and Western encephalitis.

Culex nigripalpus is chiefly a tropical insect and an important pest in flooded fields. It is the proven vector of the St. Louis encephalitis of the Tampa Bay, Fla. outbreak in 1962.

Culex pipiens—quinquefasciatus types: C. pipiens is the common northern house mosquito, *C. quinquefasciatus,* the southern house mosquito. One or both are seen in every state in the union. These are the "singing" mosquitoes, and are considerable pests. They are also vectors of the St. Louis encephalitis virus.

Aedes sollicitans is a vicious biter, a real pest, and a strong wide-ranging flier. This species is not found indoors often; it may carry the Eastern encephalitis virus.

Aedes vexans is the most widespread *Aedes* species in the United States. It is the most abundant and troublesome mosquito in many areas.

Aedes aegypti and lesser known species can transmit the equine encephalitides.

Anopheles species may be vectors of Western encephalitis in areas where *Culex* does not appear.

The adult mosquito vector remains infectious for the duration of its life which may exceed 2 months.

The genera of vectors of the tick-borne encephalitides are *Dermacentor, Haemaphysalis,* and *Ixodes* in Russia and Asia, and *Ixodes* in Europe.

A species of avian mite *(Dermanyssus gallinae)* also seems to be significant as a vector and in maintaining a reservoir of arboviruses among birds and within itself as well. The viruses are passed on transovarially for successive generations of mites, and to bird-hosts via the bite of the insect.

The significant hosts and chief reservoir of the mosquito-borne encephalitides are birds. Studies show that small birds, e.g., the English sparrow, grackle, and the red-winged black bird develop a high level of viremia (virus count in the blood) for 2-5 days during which time the mosquito can ingest sufficient virus to become a vector. The birds do not usually become ill. In reservoir animals that hibernate, the viremia may be prolonged.

The worldwide distribution of birds, their small size, and itinerant habits are qualities that assure the persistence and spread of these viruses. To a much lesser extent, small rodents, and even snakes can be sources of the viruses.

Although man and the larger farm animals, mainly the horse, can become clinically very ill from mosquito-borne encephalitis, it is questionable that they are ever the source of the disease because a sufficient level of viremia is not attained to permit transmission. A mosquito blood meal would therefore be too low in virus count to inoculate another victim. This is not so with the smaller hosts mentioned above.

The usual cycle of transmission is from small animal hosts (rodent, bat, or bird) to arthropod vec-

tor to small animal host, etc. Man or horse contracts disease through the bite of an indiscriminant mosquito or tick, becoming a dead-end in the cycle, and does not, in turn, become a source for the reasons outlined above. In some instances, such as in Eastern encephalitis, the epidemiologic relations between animal host and arthropod vector are more complex and poorly understood.

A wide variety of hosts from birds to sheep and goats are reservoirs for tick-borne encephalitis. The tick is also able to transmit the virus transovarially so it serves as a reservoir as well as a vector.

ADVANCED COURSE IN NUCLEAR SCIENCE FOR MEDICAL OFFICERS (NSMO) SPONSORED BY THE DEFENSE ATOMIC SUPPORT AGENCY (DASA) AT THE UNIVERSITY OF ROCHESTER, ROCHESTER, NEW YORK

CLASS	*INCLUSIVE DATES*	*DEADLINE DATE TO APPLY*	*SECURITY CLEARANCE REQUIREMENTS*
#19	June 1966—July 1967	15 January 1966	*Top Secret*

Mission: It is the mission of the NSMO Course to provide the opportunity for a limited number of selected Army, Navy and Air Force Medical Officers to acquire the additional technical education needed to cope with the radiobiological problems involved in all phases of the National nuclear energy program.

Scope: The course provides for a review of selected portions of mathematics and physics during the refresher phase, followed by a full academic year of graduate study involving radiological physics, health physics, biological effects of radiation, evaluation of radiation hazards, environmental hygiene and toxicology, and as electives, related areas of industrial medicine and radiology. Completion of the academic phase at acceptable performance levels can lead to a Master's Degree in Radiation Biology in one year for those entering with doctoral degree, and upon completion of additional research or special studies for those not having previous professional training. The academic phase is followed by a study of practical military nuclear medicine. During the course the medical aspects of nuclear radiation over the complete range of intensity levels from low-level, peacetime laboratory situations through high-level, full scale nuclear warfare situations are discussed.

It is anticipated that this course will be as follows:

PHASE I (9 weeks) Academic Refresher—Summer School Session, University of Rochester, Rochester, New York.

PHASE II (10 months) Radiation Biology—School of Medicine and Dentistry, University of Rochester, Rochester, New York.

PHASE III (4 weeks) Military Nuclear Medicine—Field Command, DASA, Sandia Base, Albuquerque, New Mexico or other appropriate installations.

Eligibility: The course is primarily designed for officers of the Medical Corps. However, officers of the Medical Service Corps, in very closely allied medical fields who have had some graduate work beyond the B. S. degree may also be eligible for selection.

Requests should be forwarded in accordance with BUMED INSTRUCTION 1520.10 Series and comply with the deadline date as indicated above. All requests must indicate that a security clearance of TOP SECRET has been granted to the officer requesting attendance, or that action to obtain clearance has been initiated.—Medical Corps Branch, BUMED.

ANNUAL MEETING OF AMERICAN SOCIETY OF ANESTHESIOLOGISTS

The Annual Meeting of the American Society of Anesthesiologists will be held at the Denver-Hilton Hotel, Denver, Colo., 23 to 27 October 1965.

It is anticipated that round trip government air transportation will be available for nominees stationed at East Coast Activities who are attending the meeting. This flight is tentatively scheduled to depart from the U.S. Naval Air Facility, Andrews Air Force Base, Washington, D. C. at 0900 Friday, 22 October 1965, with a stop over at NAS Glenview, Chicago, Ill., and will depart Denver at 0800, Thursday, 28 October 1965, via NAS Glenview, for Washington, D. C.

Medical officers desiring seat reservations on the

airlift should submit their requests immediately to BuMed Code 31. Phone call reservations accepted. (OX 6-1834 or OX 6-1280)

CHEMICAL, BIOLOGICAL AND RADIOLOGICAL WEAPONS ORIENTATION COURSE

Eight classes for the Chemical, Biological and Radiological Weapons Orientation Course, to be conducted at the U.S. Army Chemical Corps Proving Ground, Dugway Proving Ground, Dugway, Utah, by the Department of the Army during the Fall and Winter 1965 and Spring 1966, have been added to those previously published in the U.S. Navy Medical News Letter, 46(1) of Friday, 9 July 1965. Therefore, the previous article is hereby modified to include the classes scheduled to commence on the dates indicated below:

27 September 1965
25 October 1965
13 December 1965
14 March 1966
9 May 1966
6 June 1966
13 June 1966

—Medical Corps Branch, BUMED.

DID YOU KNOW?

That during World War II cases of P. *falciparum* malaria in the New Georgian and Guadalcanal areas were frequently mistaken for acute abdominal emergencies. Surgery failed to reveal an acutely inflammed appendix; the majority of these cases later proved to be caused by *P. falciparum* parasitemia.

When a malaria diagnostic service extension was established in the surgical tent, many cases of acute abdomen resolved on anti-malarials alone without surgical intervention.

(Personal letter from W. G. Downs, MD, Yale University, School of Medicine, of 16 August 1965.)

REFRIGERATOR ENTRAPMENT

An illustrated 14-page pamphlet entitled "Children and Refrigerator Entrapment," written as a teaching guide for the prevention of deaths due to suffocation in refrigerators, was issued by the Public Health Service's Division of Accident Prevention, U.S. Department of Health, Education, and Welfare.

The Public Health Service publication, Number 1259, may be purchased for 15¢ a copy from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C., 20402.

Reports indicate that approximately a million refrigerators are discarded annually in the United States. An estimated 43 children died last year in refrigerator entrapment accidents. In order to prevent such deaths from occurring in the future, the Division of Accident Prevention urges teachers, nurses and community leaders to obtain this guide.

The booklet is a supplement to PHS Publication No. 1258, entitled "Preventing Child Entrapment in Household Refrigerators," which was prepared in March, 1965, for use by the general public.—USDHEW, Washington, D.C.

SILVER TURNS TO GOLD

On Wednesday, 25 August 1965, George M. Silver of Rehoboth, Mass. became the only man in an organization of more than 2,000 women, and his wife didn't object.

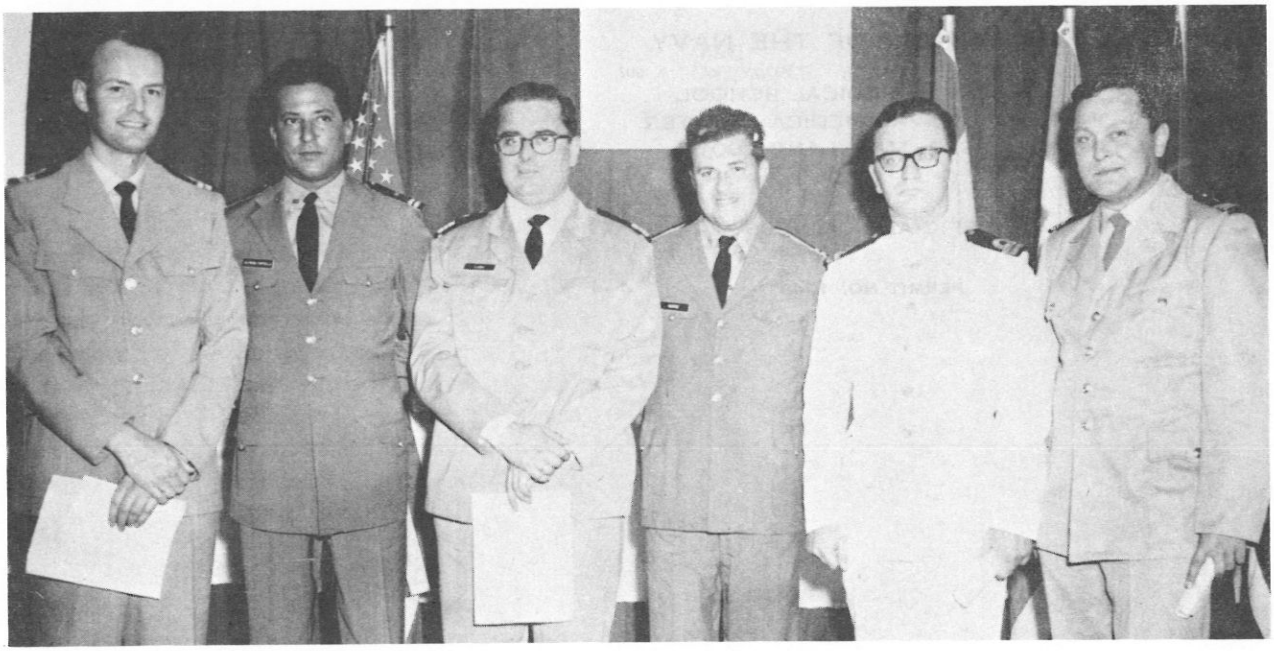
At ceremonies commencing at 10:00 a.m. at Chelsea Naval Hospital, one of the Navy's oldest, Mr. Silver became one of the Navy's newest . . . Navy Nurses, that is. The former Navy Hospital Corpsman thus became the first officer in the traditionally "female only" Navy Nurse Corps.

LCDR Edith A. Prencipe, NC USN, Nurse Programs Officer, Boston, Mass., administered the oath of office for the Navy Nurse Corps while Mrs. Silver and Ensign Silver's 3 year old son, Gregory, looked on.

Ensign Silver served as a Navy Hospital Corpsman at the Naval Hospital, Memphis until 1960. Upon leaving the Naval Service he enrolled at the McLean Hospital School of Nursing, Belmont, Mass., graduating in 1964. He has been employed at Taunton State Hospital, Taunton, Mass., specializing in Psychiatric Nursing, his major field of interest.

Following a four week orientation course at the U.S. Naval Base, Newport, Rhode Island, Ensign Silver will report to the U.S. Naval Hospital, Oakland, California.

CAPT L. L. Haynes, MC USN, Commanding officer of the U.S. Naval Hospital, Chelsea, Mass., and CDR Grace Jacobs, NC USN, the Chief of Nursing Service were representatives for the Bureau of Medicine and Surgery, Navy Department on the occasion. Others attending included CAPT James McLaughlin, MC, USN, First Naval District; CDR Robert Adams, USN, Commanding Officer, Boston Navy Recruiting; and Nurse Program officers, LCDR E. Anne Baker and LT Elinor M. Sullivan. —Nursing Division, BUMED.



Left to right. LT MED. Jens Smith-Syvertsen (Norway), LT MD Alfredo Portella (Brazil), LT MD Ary de Matos (Brazil), Commandante Medico Antonio de Lara (Spain), LT (MC) Theodore Iordanidis (Greece), and LT Dr. L Jurcher (West Germany).

SCHOOL OF SUBMARINE MEDICINE GRADUATES MEDICAL OFFICER CLASS

The School of Submarine Medicine of the Submarine Medical Center at the U.S. Naval Submarine Base in Groton, Connecticut, held graduation ceremonies for the most recent class on 1 July 1965. The commencement address was given by CAPT Charles Young, USN, Officer-in-Charge of the Submarine School. Diplomas were presented by Captain Young. Invocation and benediction were given by LT Samuel Baez, ChC, USN.

LT Roger K. Jones, MC USNR, was honor man of the class and received the Surgeon General's award in recognition of his scholastic achievement. The award was presented by CAPT C. L. Waite, MC USN, Commanding Officer of the Submarine Medical Center. Another member of the class, LT Robert C. MacDonald, MC USNR, graduated with distinction.

After completion of the five months course which includes instruction in diving medicine, hyperbaric medicine, atmosphere control, nuclear physics, radiobiology, preventive medicine, and sanitation, submarine escape procedures, and phases of medicine and surgery applying to submarine medicine, each of the U.S. officers are scheduled to report to one of our nuclear-powered Polaris submarines. One member of the class, CDR John Caruso, Jr., MC USN, graduated absentia, since operational assignment required his reporting to the U.S.S. CASIMIR PULASKI, SSBN–633 a week before the end of the course.

The class is noteworthy in having the largest number of foreign naval medical officers to be trained in the School at one time. There were six doctors from five allied nations participating in the course: Norway, West Germany, Greece, Spain, and Brazil.

After a five-month separation from their homes, they will leave within a few days to return to their own countries to fill submarine and diving billets in their own navies.

The course, directed by CDR A. D. James, MC USN, was presented to the students by LCDR J. C. Rivera, MC USN, LCDR R. F. Reed, MSC USN, LT H. J. Alfandre, MC USN, LT A. L. Dennison, MC USN, LT J. I. Lynch, MC USN, LT R. F. Schillaci, MC USN, LT L. N. Terry, MC USN, and a staff of ten hospital corpsmen.

The graduation date of 1 July coincided with the first birthday of the U.S. Naval Submarine Medical Center, which was commissioned on 1 July 1964, as an important medical center for the U.S. Navy.—News Release, U.S. Naval Submarine Medical Center, Groton, Conn.

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